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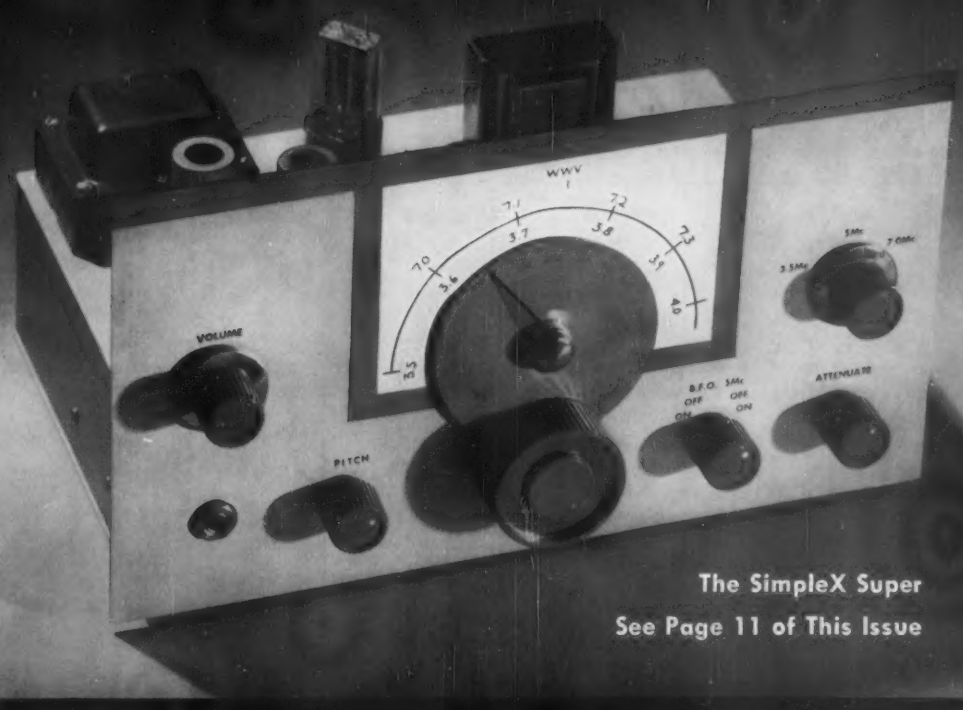

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See Page 11 of This Issue

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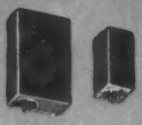

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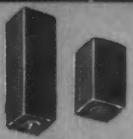

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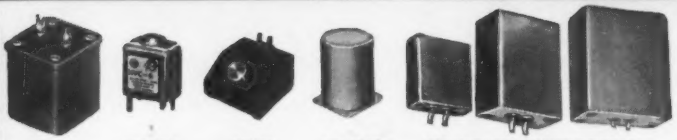

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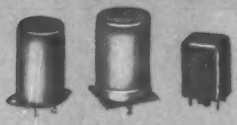

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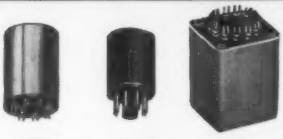

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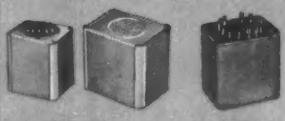

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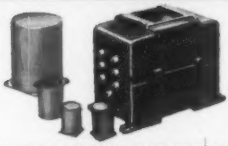

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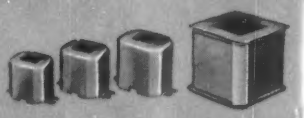

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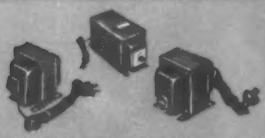

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Once again it is our privilege to express the best wishes of the entire Hallicrafters family through the words of "*A Christmas Bonus.*" It was written in 1956 by the late Cyrus T. Read, W9AA — a loyal friend of amateur radio whose entire life reflected the spirit of ". . . good will toward men."

Bill Halligan, Jr.

A Christmas Bonus

IN THE DAY BY DAY PURSUIT of our hobby we radio amateurs have a wonderful time. The fascination of experimenting with new circuits and equipment — the thrill of DX — the organized teamwork of net operation — the excitement of Field Day, Sweepstakes, the DX Contest — all combine to make ours an incomparable avocation. In the midst of such absorbing interests it may be that we fail to remember the one enduring reward which comes to all of us through our amateur activity.

THAT REWARD is the many lifelong friendships which we all establish directly or indirectly through amateur radio. From the day we start to work toward an amateur license we begin to make new friends. Some may live near enough to help in learning the code, building equipment, or putting up an antenna. Others are so far away that we never hope to see them in person. None-the-less, near or far, they are all close friends. Most of us have had the heart-warming experience of visiting some distant place, calling on an amateur whom we knew only through contacts over the air, and being welcomed like one of the family.

WE AT HALLICRAFTERS like to feel that those interested in amateur radio are our friends. And, at this particular season, we want to extend to all amateur enthusiasts, everywhere, our sincere best wishes for a Very Merry Christmas and a Happy New Year.

Vy 73,

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DECEMBER 1958

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—CONTENTS—

TECHNICAL —

The "SimpleX Super" Receiver . . *Byron Goodman, W1DX* 11
Wide-Band Moderate-Power Dummy Loads *David T. Geiser, WA2ANU* 18
A Simple Quad Antenna Support *Jack G. Hollenbeck, W6JIC* 27
Working Ionospheric Scatter on 50 Mc. *Joe Taylor, jr., K2ITP* 28
New Thresholds in V.H.F. and U.H.F. Reception *Ross Bateman, W4AO and Walter F. Bain, W4LTU* 30
Technical Topics:
Input Impedance and Feed-Through Power in Grounded-Grid Amplifiers 32
Screen Protection 184
Ten-Meter Transistorized Phone Transmitter *Major Gilbert, K6LMW* 36
Recent Equipment:
Globe Sidebander DSB-100 40
The Heath Mohawk Receiver Kit 41
Technical Correspondence:
The Slot Antenna . . . . . *Julian N. Jablin, W2QPQ* 44
Amateur Satellite Reception and Recording *Frank K. Dearborn* 44
New Apparatus:
Johnson Sockets for External Anode Tubes 192
The Cushcraft 2-Meter Halo 194
Miniature Components 194

BEGINNER —

The "SimpleX Super" Receiver . *Byron Goodman, W1DX* 11
The Novice 50 Watter . . . . . *Lewis G. McCoy, W1ICP* 15

MOBILE —

Two-Tube Mobile Transmitter . . *M. J. Westrem, W0HOB* 24

OPERATING —

Record 11,316 Hams on 1958 Field Day! *Phil Simmons, W1ZDP* 46
12th V.H.F. Sweepstakes Announcement 66
Originating Message Traffic . . . . . *David B. Fell, W3TN* 76
DX Century Club Roster 104
A Method for Scoring Hidden Transmitter Hunts *Frank A. Jerome, K1CQP* 206

GENERAL —

Yasme II to Aves Island *Danny Weil, VP2VB, YV0AB* 72
The Perils of Six Meters . . . . . *Robert Seals, K9AHK* 75
From Pole to Pole on 40 Watts *Daniel Linehan, W1HWK* 78
Highball to Eyeball . . . . . *Mark E. Ballard, W9BSZ* 210
What Is a DXer? . . . . . *Paul Amis, W7RGL* 220

"It Seems to Us" 9
Hamfest Calendar 10
Quist Quiz 45
Silent Keys 45
In *QST* 25 Years Ago 45
Feedback 45, 190
IARU News 65
Hints and Kinks 68
YL News and Views 80
How's DX? 83
The World Above 50 Mc. 89
Correspondence From Members 94
Operating News 95
With the AREC 97
Station Activities 110
ARRL QSL Bureau 224
Index of Advertisers 232
QST Index for 1958 235

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from all of us to you

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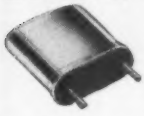

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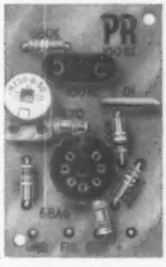

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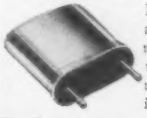

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Arizona	W7QIF	Cameron A. Allen	1020 East Maryland Ave.	Phoenix
San Diego	W6LRU	Don Stansifer	4427 Pescadero	San Diego 7
Santa Barbara	K6CVR	Robert A. Hemke	728 W. Mission	Santa Barbara
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Northern Texas	W5BNG	L. L. Harbin	4515 Calmont	Fort Worth 7
Oklahoma	W5FEC	Richard L. Hawkins	1408 Bell Ave.	Lawton
Southern Texas	W5QEM	Roy K. Eggleston	1109 Vernon Drive	Corpus Christi
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Maritime	VE1WB	D. E. Weeks	R.R. 3	St Stephen, N. B.
Ontario	VE3NG	Richard W. Roberts	170 Norton Ave.	Willowdale, Toronto, Ont.
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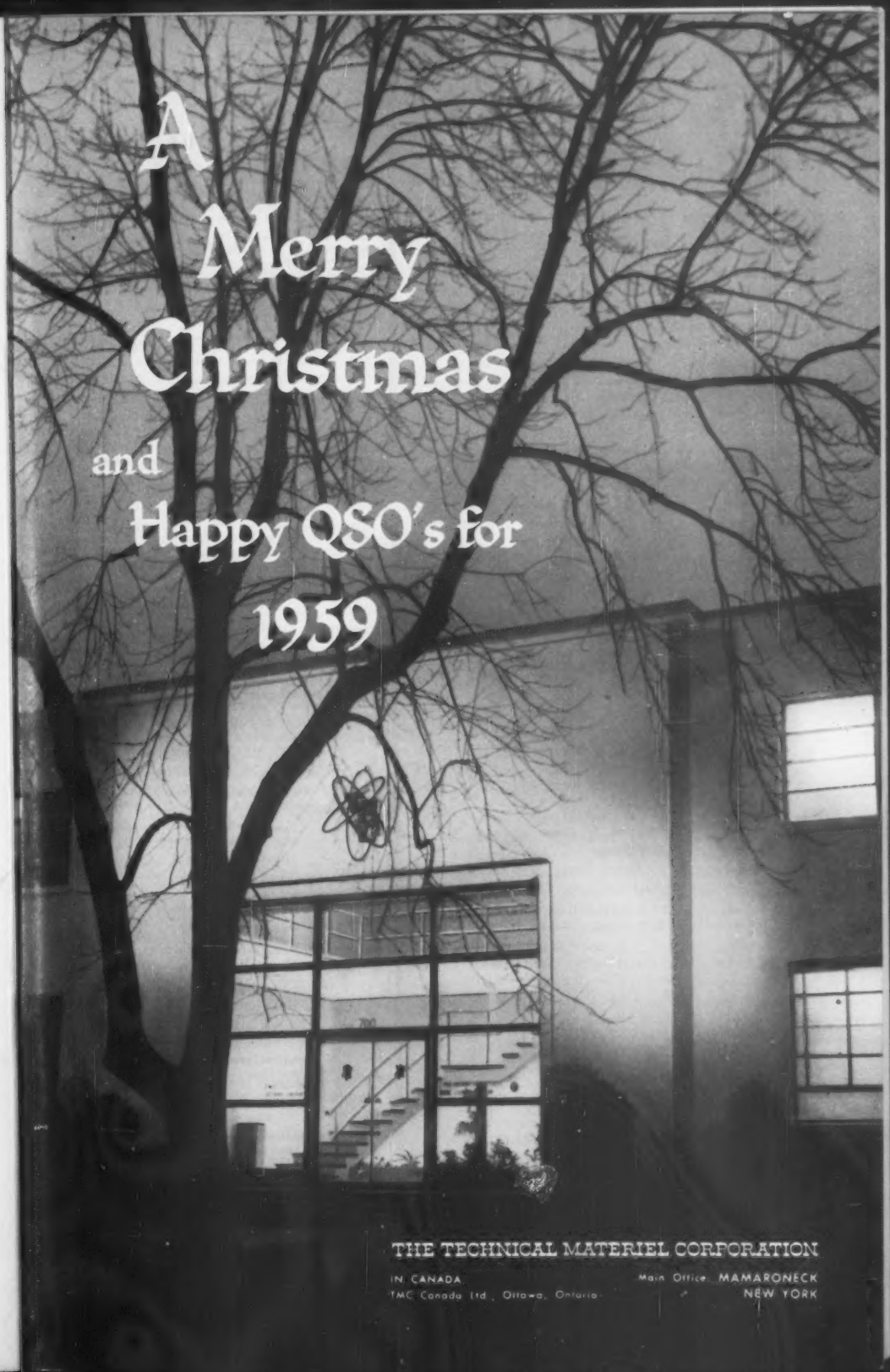
Alberta	VE6VM	Gordon W. Hollingshead	108 Hudson Rd.	Calgary, Alta.
British Columbia	VE7JT	Peter M. McIntyre	981 West 26th Ave.	Vancouver, B. C
Yukon				
Manitoba	VE4IF	James A. Elliott	190 Oakdean Blvd.	St. James, Winnipeg 12
Saskatchewan	VE5LU	Lionel O'Byrne		Rowatt

*Official appointed to act temporarily in the absence of a regular official.


A Merry Christmas
and
Happy QSO's for
1959
THE TECHNICAL MATERIEL CORPORATION
IN CANADA
TMC Canada Ltd., Ottawa, Ontario
Main Office MAMARONECK
NEW YORK

THE AMERICAN RADIO RELAY LEAGUE, *INC.*,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.

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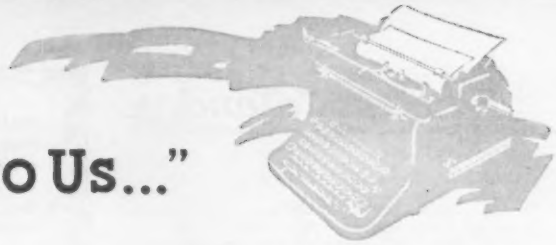


"It Seems to Us..."

MISINFORMATION

In recent weeks several rumors and other forms of distorted fact have crossed the editor's desk — sufficiently widespread, we think, to require correction.

In some quarters there are cries of alarm that the 15-meter band is being taken away from amateurs, or at least being moved somewhere else, and that the League is meekly acquiescing to this outrage without a fight. We can tag that one quickly — someone left off his bifocals when he read a *QST* item dealing with the 21,000-Mc. (*not* kilocycles) band and its FCC-proposed move to 22,000 megs, in which the League concurred. There is no change proposed at 15 meters.

We have received letters of indignation from Technicians that the League is not looking out for their interests. This is obvious, they say, because ARRL concurred in an FCC proposal (actually, an alternate version of a League petition to tighten licensing procedures) which would "require all Technicians to be re-examined by an FCC engineer or lose our tickets." Wrong again, OMs. The proposal, in which the League did indeed concur, simply gives the Commission authority, at its discretion, to call up Technicians (and Novices, too) for personal examination. It is precisely the same procedure applying for many years to Conditional Class licensees, and therefore only puts all mail-system licenses on an equal basis. FCC seldom has to use this authority, and does so only in cases where a "mail order" amateur is cited several times for regulatory violations to the point where his actual qualifications for the license are open to question, or whenever other information available to the Commission similarly casts sufficient doubt on the amateur's real ability. No wholesale re-examination is contemplated.

Some of our Technicians have also misunderstood another current FCC proposal which, among other things, would authorize 6F2 (essentially, audio-frequency-shift keying) in the 50-Mc. band. Once again the cry is that Technicians are losing privileges. Not so! No Technician privilege will be withdrawn under the proposal. The new form of emission, assuming its adoption, will be equally available to Techs if they want to use it.

Nor is the printed page immune to misinformation. One esteemed contemporary just published a quiz, sent in by a radio club, which included some amateur regulatory questions. Good idea but the wrong dope in the case of an example that is likely to be run into by hundreds of amateurs. The published answer to one question is that if you're going to engage in portable operation away from home for more than 48 hours you don't need to send in prior written notice to the Engineer in Charge of the radio inspection district in which such mobile operation is intended. (A *QST* reference is even given as authority.) Not so, OMs. You *do* have to give such notice; the guy who read the *QST* reference misread it. The FCC still requires such notice; the action which the FCC took and which has been erroneously interpreted in this case merely eliminates the requirement of continuing the old monthly notices on extended trips under certain conditions; the *initial* notice for over-48-hour operation is still required and you'd better make sure you send it in if you don't want to get into hot water. To be on the safe side, consult Sections 12.90, 12.91 and 12.93 of the Amateur Rules if you plan on operating either portable or mobile away from home for more than 48 hours. What! You don't have a *License Manual?* Better get one or make sure your club secretary has an up-to-date version! (50¢ at your dealer's or postpaid from ARRL.)

ARL FIFTY-EIGHT

From time to time in this section we like to bring up the public relations aspects of our hobby. Not the least of numerous ways in which the public comes in contact with amateur radio is our handling of messages, and this month traffic on the amateur nets will swell to its Holiday peak. One p.r.-minded club is setting up an amateur station at each of several shopping centers in a large eastern city, offering our message service.

If handled efficiently, this can be an excellent way to call the favorable attention of non-amateurs to the usefulness of ham radio. On the other hand, if such an operation is poorly run — if relaying arrangements are not carefully planned in advance, if amateurs along the way are lackadaisical in forwarding the messages — the total impression will be exactly the opposite of what we seek to achieve.

So pitch in — make it a point to be in your section net as often as possible this month. Accept message traffic for your town or immediate area. Until delivered, a message on the amateur bands is a liability. After prompt and courteous delivery, you have added an important nail to the structure of public service.

Hamfest Calendar

California — Everyone is invited to attend the annual Christmas Dinner of the San Francisco Radio Club at the New Tivoli Restaurant, 1438 Grant Avenue, San Francisco, on Saturday night, December 20, at 7:00 P.M. Tickets are $2.50 per person. For reservations or further information, please contact Harry Witzke, WV6CVJ, 1256 Masonic Avenue, San Francisco. Phone Underhill 1-5650.

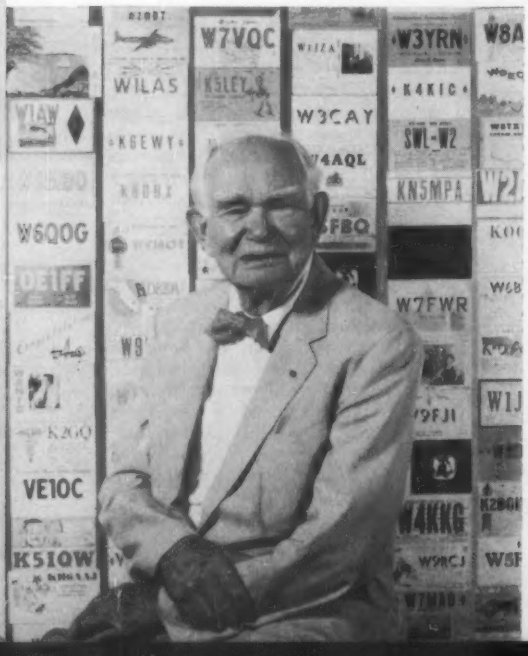
Maryland — The Chesapeake Amateur Radio Club will run a transmitter hunt on Sunday, December 14, starting at one P.M. The starting point will be the Food Fair parking lot, Hillendale Shopping Center, Loch Raven Boulevard and Taylor Ave., Baltimore. The hunt will be on 28.88 Mc. There will be refreshments, and prizes to the winners.

Strays

Earlier this year, through the efforts of a number of people, amateurs all over the country sent greetings on his 85th birthday to Dr. Lee De Forest. At the ARRL National Convention the Potomac Valley Radio Club collected hundreds of personal, signed messages which were forwarded to the doctor. W8BAH suggested a campaign of birthday greetings on QSL cards and subsequent to a W1AW bulletin hundreds of QSLs were delivered to Dr. De Forest.

A 30-minute tape was recorded by Dr. De Forest, thanking amateurs for their thoughtfulness on his birthday. On the tape Dr. De Forest also recounts many of his early experiences in radio. We have the master copy here at the Headquarters, and it is simply fascinating to hear. This tape is available from our Training Aids section to all affiliated clubs—it will be interesting to old-timer and newcomer alike. The actual recording was done by W6MBD, recording supervisor at 20th Century-Fox.

In the photograph below Dr. De Forest is sitting before some of the thousands of QSLs and messages that he received for his 85th birthday, cards that meant a great deal to him.



Holiday greetings from all of the Headquarters staff! We can't send a personal card to each and every one of you, but it is with pleasure that we do send you this, the largest issue in *QST*'s history.

HAMS AT HEADQUARTERS
W1AW, ARRL Headquarters Station

The following list shows the present calls and former calls (if any) of the Headquarters gang:

W1BDI	F. E. Handy (1XAH, 8BCM)
W1BUD	A. L. Budlong (1A8N, W1JFN)
W1CIE	Constance Campbell
W1CUT	E. Laird Campbell (W5TQD)
W1DF	George Grammer (3AIH, 3ARJ)
W1DX	Byron Goodman (W6CAL, W1JPE)
W1FEA	Belden Morgan, jr.
W1FGF	Ronnie Gann
W1HDQ	E. P. Tilton
W1ICP	L. G. McCoy (W9FHZ, WØICP)
W1IKE	Richard L. Baldwin
W1JMY	J. A. Moskey
W1LLF	Robert A. Smith
W1LVQ	John Huntoon (W9KJY)
W1NJM	George Hart (W3AMR, D4ALS)
W1QIS	Murray Powell (1BHQ)
W1TS	D. H. Mix (4DM, 9AT)
W1TUW	David Cabaniss (CN8HD)
W1UED	Perry Williams
W1VG	L. A. Morrow (8AOF, 1VC, 8BZJ, 8BAB, W8JNI, W8DKE, W9VKF)
W1VLH	Mason P. Southworth
W1WPO	R. L. White (W6QEZ, W6YYN, W2QPZ, KH6QJ)
W1WPR	C. R. Bender (W3ODU)
W1YYM	Ellen White (W6YYM, W2RBU, KH6QI)
W1ZDP	Phil Simmons (W3VES, W9VES)
W1ZIF	Kenneth Lamson
W1ZIM	Miriam Knapp
W1ZJE	Lillian M. Salter

William A. Ladley, W6RBQ

It is with extreme regret we report the passing of William A. Ladley, W6RBQ, Director of the Pacific Division of the League from October 21, 1946 to January 1, 1950. Bill had also served as Section Communications Manager for the San Francisco section from December 15, 1943, through February 15, 1946, and had been a director of the San Francisco Radio Club. He held appointments as Route Manager, Official Relay Station and Official Bulletin Station in the League's operating organization, and was a member of the A-1 Operators' Club and the Amateur Radio Emergency Corps. He had also served as a captain in the California State Guard. Not so active in recent years due to ill health, Bill will nevertheless be deeply missed, especially by the old-timers in the San Francisco area.

The SimpleX Super receiver uses three dual tubes and a crystal filter to cover the 80- and 40-meter bands, and it can tune to 5 Mc. for copying WWV. The dial scale is made from white paper held to the panel by red Scotch tape; the pointer is a slice of the tape.

The "SimpleX Super" Receiver

BY BYRON GOODMAN,* W1DX

On several occasions when the author has played around with one of the inexpensive (under $100) short-wave receivers, he has wondered how many new amateurs handicap themselves through the false economy of buying such a receiver. The mere thought of struggling through a QSO in a crowded band with one of these toys is enough to make seasoned amateurs weep. Any such experience would certainly justify a beginner's wondering how anyone can get enjoyment out of ham radio. Frankly, these receivers are aimed at the short-wave listener market, not the radio amateur. The receivers aren't too bad for their intended purpose of copying the louder short-wave broadcast stations, but they smell in spades as "communications receivers" if you have ham communications in mind.

The 3-tube receiver to be described will permit the single-signal reception[1] of code signals. Single-sideband phone can be handled with no difficulty at all, even though the tuning rate is a bit faster than we would like. With the b.f.o. turned off for the reception of a.m. signals, a threshold effect shows up that prevents your digging all the way down for the weak ones, but you can still copy plenty of a.m. signals. Since the receiver uses only three tubes, it doesn't have the more-than-enough gain of a big receiver, and its performance won't be very impressive on a poor (short or low) antenna. However, if you use your transmitting antenna for receiving, as you should, you will find yourself backing down on the volume control to save your ears.

Referring to the circuit diagram in Fig. 1, the receiver is a superheterodyne with an intermediate frequency of 1700 kc. With the h.f. oscillator tuning 5.2 to 5.7 Mc., the 3.5- or the 7-Mc. amateur bands can be tuned merely by retuning the input circuit, L_1C_1. Since C_1 is large enough to hit the two bands without a coil change, the band-changing process consists of turning C_1 to the low- or high-capacitance end of its range. To copy WWV at 5 Mc., the oscillator must be tuned to 3.3 Mc., and this is done by switching in an additional capacitor across the oscillator circuit.

If you are disappointed because the receiver doesn't tune the 21-Mc. band, remember that the "under-$100" receivers don't either. Sure, the dials show 21 Mc., but try to use the receivers to hold a signal for any length of time! The SimpleX Super, with a crystal-controlled converter[2] be-

The name of this receiver derives from "simple," "X" for crystal (filter), and "super" for superheterodyne; hence a "simple crystal-filter superheterodyne." For about $50 and a few nights at the work bench this little receiver will allow you to copy practically any c.w. or s.s.b. signal in the 40- or 80-meter band that a much more expensive receiver might drag in. By the flip of a switch you can tune to 5 Mc. for WWV, a stunt some more-expensive receivers can't do!

* Assistant Technical Editor, *QST*.

[1] Single-signal reception requires a receiver with sufficient selectivity so that setting the b.f.o. frequency off the mid-frequency of the i.f. gives a stronger signal on one side of zero beat than on the other. An excellent c.w. receiver will show no trace of signal on "the other side" of zero beat.

[2] McCoy, "The 'Bonus' 21-Mc. Converter," *QST*, Oct., 1958.

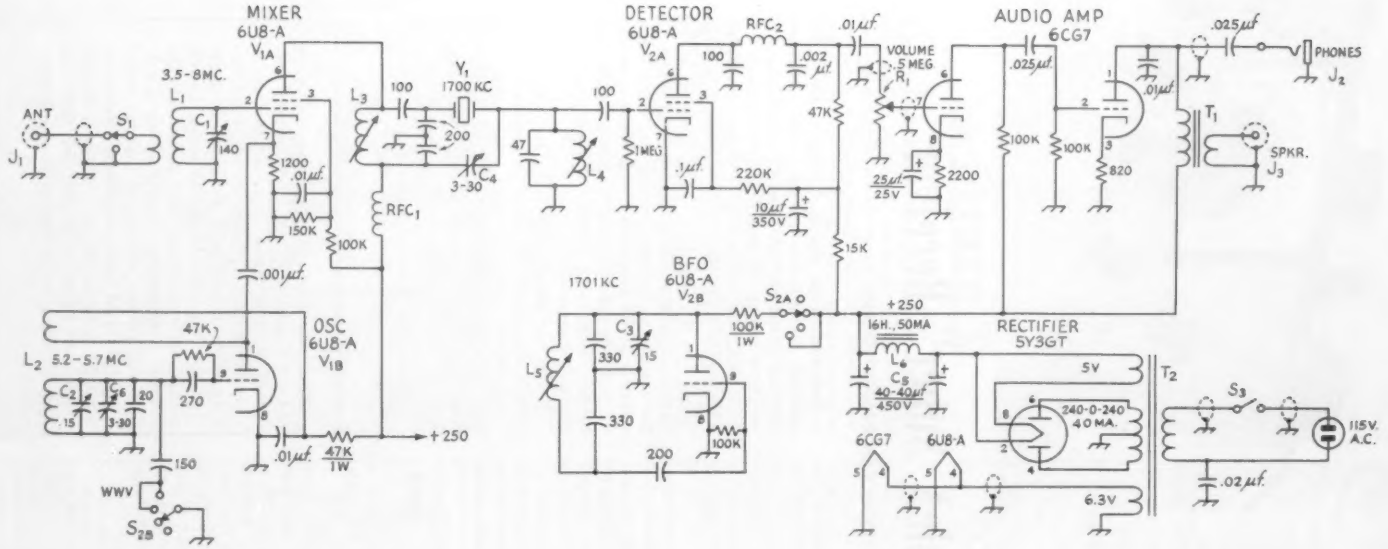


Fig. 1—Circuit diagram of the SimpleX Super receiver. Unless otherwise indicated, capacitances are in μμf., resistances are in ohms, resistors are ½ watt. Polarity shown on electrolytic capacitors; fixed capacitors 330 μμf. or less are silver mica or NPO ceramic. Nonelectrolytic fixed capacitors over 0.025 μf. are 400-volt molded tubulars. Fixed capacitors 0.001 through 0.025 are ceramic.

C_1—140-μμf. midget variable (Hammarlund APC-140-B).
C_2—15-μμf. midget variable (Hammarlund HF-15).
C_3—15-μμf. trimmer (Hammarlund MAPC-15-B).
C_4, C_6—3–30-μμf. mica compression trimmer.
C_5—Dual 40-μf. 450-volt electrolytic (Mallory TCD-78 or equiv.).
J_1, J_3—Phono jack.
J_2—Open-circuit headphone jack.
L_1, L_2—See Fig. 2.
L_3, L_4—105–200-μh. slug-tuned (North Hills 120-H coil mounted in North Hills S-120 shield can).
L_5—36–64-μh. slug-tuned (North Hills 120-F coil mounted in North Hills S-120 shield can).
L_6—16-hy. 50-ma. filter choke (Knight 62-G-137 or equiv.).
R_1—½ megohm volume control, audio taper, with switch.
RFC_1, RFC_2—2.5-mh. r.f. choke (Waters C1155).
S_1—1-pole 12-position (2 used) rotary ceramic switch (Centralab PA-2001).
S_2—2-pole 6-position (4 used) rotary ceramic switch (Centralab PA-2003).
S_3—S.p.s.t. switch, part of R_1.
T_1—10,000-ohms-to-voice-coil output transformer (Stancor A-3822 or equiv.).
T_2—480 v. c.t. at 40 ma., 5 v. at 2 amp., 6.3 v. at 2 amp. (Knight 62-G-034 or equiv.).
Y_1—1700-kc. crystal in FT-243 holder (E. B. Lewis or equiv.).

(All radio stores do not handle the above components. For prices and names of dealers write to North Hills Electric Co., 402 Sagamore Ave., Mineola, N. Y.; Knight is handled by Allied Radio, 100 N. Western Ave., Chicago 80, Ill.; Waters Mfg. Inc., Boston Post Rd., Wayland, Mass.; E. B. Lewis, 11 Bragg St., E. Hartford, Conn.

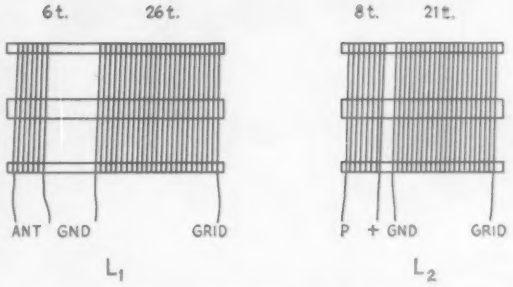


Fig. 2—Details of the coil construction. Each one is made from B & W 3016 Miniductor stock, which is wound 32 t.p.i. and 1-inch diameter. The separation between coils in L_1 is 7 turns; the separation between coils in L_2 is 1 turn. It is important that the coils be connected as indicated.

The Miniductor stock can be cut into the required lengths by pushing in a turn, cutting it inside the coil and then pushing the newly-cut ends through to outside the coil. Once outside, it is easy to peel away the wire with the help of long-nose pliers. When sufficient turns have been removed, the support bars can be cut with a fine saw.

tween it and the antenna, will handle 15 meters like 80.

Selectivity at the i.f. is obtained through the use of a single crystal. Although not as sharp as the usual 455-kc. crystal filter, it is sharp enough to provide a fair degree of single-signal c.w. reception and yet broad enough for good copy of an s.s.b. phone signal.

In the detector stage, the pentode section of a 6U8A is used as a grid-leak detector, and the triode section serves as the b.f.o. Stray coupling at the socket and in the tube provides adequate injection. Audio amplification is obtained from the two triode sections of a 6CG7. The primary of a small output transformer, T_1, serves as the coupling for high-impedance headphone output, and a small loudspeaker or low-impedance headphones can be connected at the output winding of the transformer. Although the audio power output is less than a watt, it is sufficient to drive a loudspeaker adequately in a small quiet room.

The power supply uses a large choke and two 40-μf. capacitors, and the very slight hum that can be detected in the headphones with the volume full on is stray a.c. picked up by the detector grid; it doesn't come from inadequate filtering of the power supply. (The hum can only be heard with no antenna on; under normal operation the incoming noise will mask the slight hum.)

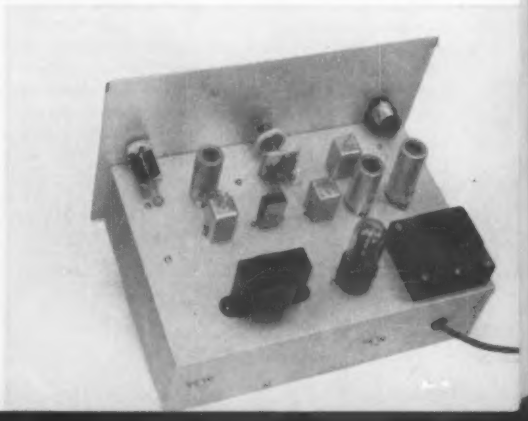
A switch at the input of the receiver is included so that the receiver can be used to listen to one's own transmitter without too severe blocking. Using the b.f.o. switch to cut in the WWV padder looks stupid, but it was done this way (instead of by the more logical S_1) to keep the input short-circuiting leads short.

Construction

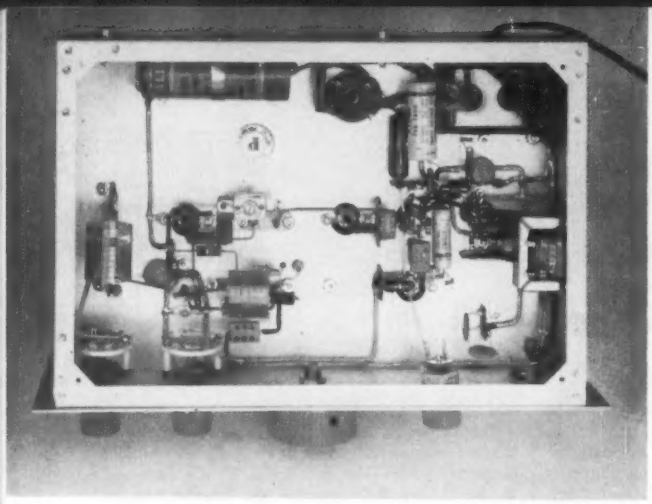
An 8 × 12 × 3-inch aluminum chassis takes all of the parts without crowding, and the location of the components can be seen in the photographs. The 7¼ × 13-inch aluminum panel (⅛-inch thick) is held to the chassis by the b.f.o. capacitor mounting screws, the phone jack, the dial drive and the two rotary switches. The tuning capacitor C_2 is mounted on a small aluminum bracket made from an extra strip of the panel material; before the bracket is finally fastened to the chassis the capacitor and bracket should be used to locate the dial hole on the panel. When drilling the hole for the dial drive, measure the dimension instead of using the template provided with the National K dial. It pays to take care in mounting the tuning capacitor and the dial, since a smooth tuning drive is an essential in any receiver. To facilitate tuning, a National HRT knob was used instead of the puny knob furnished with the K dial. The other knobs are gray National HR and HR-4.

Tie points were used liberally throughout the receiver, as junctions for components and interconnecting wires. The coils L_1 and L_2 were mounted on tie points, using short leads. If the leads from L_2 are too long, the coil will be "floppy" and the receiver may be unstable. Fig. 2 shows how coils L_1 and L_2 are constructed and connected. The leads from C_1 and C_2 are brought through the chassis in insulating grommets. The 3- to 30-$\mu\mu$f. mica compression trimmer across L_2 is soldered to the tie points that support the coil.

The receiver was wired with shielded wire for many of the leads, in an effort to minimize hum in the audio and feedthrough around the crystal filter. The shielded leads are marked in Fig. 1 where feasible; the simple rule to follow is to shield all B+ leads along with those shown shielded in Fig. 1. For ease of wiring, these shielded leads should be installed first or at least early in the construction. As the wiring progresses, a neat-looking unit can be obtained by



Top view of the SimpleX Super. The tube between the two variable capacitors is the mixer-oscillator 6U8A; the 6CG7 audio amplifier is at the far right. The flexible insulated coupling between main tuning dial and the tuning capacitor is a Millen 39016.



Shielded wire, used for most of the d.c. and 60-cycle leads, lends to the clean appearance underneath the chassis. The switch at the left shorts the input of the receiver, and the adjacent switch handles the b.f.o. and the padding capacitor for WWV.

Phono jack at the top left is for the antenna; the other phono jack is for low-impedance audio output. The headphone jack (lower right) is for high-impedance audio output.

dressing the leads and components in parallel lines or at right angles. D.c. and a.c. leads can be tucked out of the way along the edges of the chassis, while r.f. leads should be as direct as is reasonable.

If this is your first receiver or construction job, there are several pitfalls to be avoided. When installing a tube socket, first give a little thought to where the grid and plate leads will run, and orient the socket so that these leads will be direct and not cross over the socket. Believe it or not, we have seen i.f. amplifiers where each grid and plate lead had to cross over the socket to get to its respective transformer. The builder couldn't understand why the amplifier "took off" the instant the gain was advanced slightly.

Another thing to look out for is the well-meaning store clerk who sells you stranded wire for making the connections throughout the receiver. The only stranded wire in this receiver is in the leads from the transformers, filter capacitor and filter choke, and in the shielded wire, and all this only because there was no choice. Where stranded wire is used, be very careful to avoid wild strands that stray over to an adjacent socket terminal and short-circuit a part of the circuit without your knowing it. No. 20 or 22 insulated solid tinned copper wire should be used for connections wherever no shielding is used. Long bare leads from resistors or capacitors should be covered with insulating tubing unless they go to chassis grounds.

The final bugaboo is, of course, a poorly-soldered connection. If this is your first venture, by all means practice soldering before you start to wire this receiver. Read an article or two on how to solder,[3] or get a friend to show you how and to criticize your first attempts. A good soldering iron is an essential; we have seen instances of a first venture having been "soldered" with an iron that would just barely melt the solder; the iron was incapable of heating the solder and work to the point where the solder would flow properly.

There is no need to worry about the dial scale when the receiver is first built, because the receiver has to be checked. The scale is a sheet of white paper held in place by red or black Scotch tape. The pointer on the dial is a slice of the same tape.

[3] McCoy, "How To Solder," *QST*, Sept., 1958.

Adjustment

When the wiring has been completed and checked once more against the circuit diagram, plug in the tubes and the line cord and turn on the receiver through S_3. The tube heaters and rectifier filament should light up and nothing should start to smoke or get hot. If you have a voltmeter you should measure about 250 volts on the B+ line.

With headphones plugged in the receiver, you should be able to hear a little hum when the volume control is advanced all the way. If you can't hear any hum, touching a screwdriver to Pin 2 should produce hum and a loud click. This shows that the detector and audio amplifier are working.

The next step is to tune L_3, L_4 and L_5 to 1700 kc., the crystal frequency. If you have or can borrow a signal generator, all you have to do is to put 1700-kc. r.f. in at the grid of the 6U8A mixer and peak L_3 and L_4. Lacking a signal generator, you may be lucky enough to find a strong signal by tuning around with C_2, but it isn't likely. Your best bet is to tune a broadcast receiver to around 1245 kc.; if the receiver has a 455-kc. i.f. the oscillator will then be on 1700 kc. Don't depend upon the calibration of the broadcast receiver; make your own by checking known stations. The oscillator of the broadcast receiver will furnish a steady (possibly hum-modulated) carrier that can be picked up by running a wire temporarily from the grid of the 6U8A mixer to a point near the chassis of the b.c. receiver. Adjust L_5 until you get a beat with the 1700-kc. signal, and then peak L_3 and L_4. If the signal gets too loud, reduce the signal by moving the wire away from the b.c. receiver. Now slowly swing the signal frequency back and

(*Continued on page 198*)

The Novice 50 Watter

Photo above: This view of the 50 watter shows the panel arrangement and layout of the components above chassis. The crystal is between the 6146 and dial-light grommet. Behind the 6146 is the power transformer and to its right is the rectifier tube.

80 and 40 Meters With a Single 6146

BY LEWIS G. McCOY,* W1ICP

Sweet and simple. That's an apt description of the transmitter shown here. If you are interested in building your first rig, this unit should fill the bill. It is easy to build, packs a solid punch, and provides plenty of watts per dollar.

A FEW YEARS AGO the author described a one-tube high-power (Novice-style high power!) transmitter[1] that many Novices built and used with considerable success. Since then, several hams have written asking how to use a pi-network tank circuit in the rig. The transmitter shown in the photographs and Fig. 1 is such a rig. As in the earlier version, a 6146 is used in the oscillator and can be operated at approximately 50 watts input, crystal-controlled, on either 80 or 40 meters.

Circuit Details

The oscillator is of the Colpitts variety with the output taken from the plate of the 6146. A 2-volt, 60-ma. dial lamp is connected in series with the crystal, and the lamp serves as an indicator of crystal current, and doubles as a fuse in the event the crystal current becomes excessive. In the tank circuit, the coil L_1 is used in its entirety for 80-meter operation; a portion is shorted out when the transmitter is adjusted for 40 meters. On 80, S_1 is used to switch in C_3, a 680-$\mu\mu$f. mica capacitor. This capacitor is connected in parallel with C_4 which is a dual 365-$\mu\mu$f. variable. The stators of C_4 are connected together and, with C_3, provide a maximum capacitance of approximately 1400 $\mu\mu$f. This is adequate on 80 meters for working into 50-ohm loads. On 40, S_1 shorts out a portion of L_1 and removes C_3 from the circuit.

The power supply has a capacitor-input filter circuit and gives approximately 400 volts d.c. under a load of 125 ma.

Building the Transmitter

Study the photographs and Fig. 1 before starting construction. There is nothing critical about the layout of the components but it is a good idea to build your rig along the same lines as the unit shown. Before going into details of construction there are a few points that should be mentioned to make the job easier for the beginner.

* Technical Assistant, *QST*.

[1] McCoy, "One Tube — 80 and 40 Meters — 75 Watts," *QST*, Aug., 1955.

If this is your first wiring job we suggest you read an article on soldering that appeared in a recent issue of *QST*.[2] Briefly, be sure to use *resin* core solder (not acid core). Also, use a soldering iron that will deliver plenty of heat. Make sure that all wires and connections to be soldered are clean before soldering.

If you look at the bottom view you'll notice that all the components — resistors, coils and so forth — are mounted *parallel* to the chassis sides. If you remember to mount the components parallel to the sides you'll end up with a piece of equipment that you can be proud of.

The rig shown here was built on a 3 × 7 × 11-inch aluminum chassis. Look at the top and bottom views of the rig and note that the power-supply components are mounted along the back of the chassis. The transformer and rectifier tube are mounted above chassis while the remaining supply components are below deck. At one end of the chassis, below deck, the filter choke is mounted against the side wall. The electrolytic capacitors are installed on the back wall. Remember to observe correct polarity when wiring in the electrolytics. You'll find a "+" mark at one end of the capacitor and the leads from this end must be connected to the filter choke side of the B-plus line. The other ends, or "−" leads, should be connected to chassis ground.

Install a half-inch-diameter rubber grommet at one end of the chassis top. This grommet is used to hold the dial lamp I_1. The crystal socket should be installed between the grommet and the 6146 socket. The pi-network components, C_2, L_1 and C_4 are mounted at the opposite end of the chassis. C_2, the variable tank capacitor, is mounted closest to the 6146 socket. The tank coil L_1 mounts between C_2 and C_4, supported by its leads. Also between the two variables is S_1, which is mounted on the chassis front. An RCA type phono jack is used for the output terminal J_2. It is mounted on the rear of the chassis, directly behind L_1.

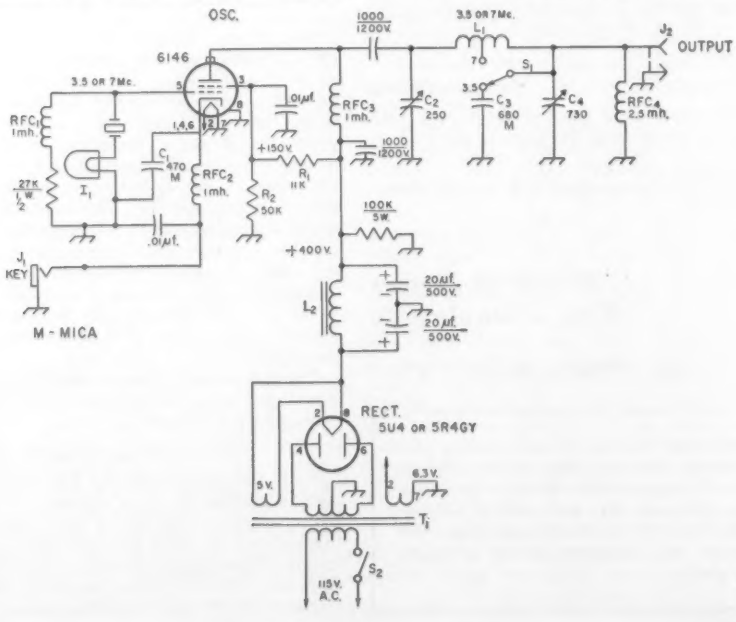
Wiring

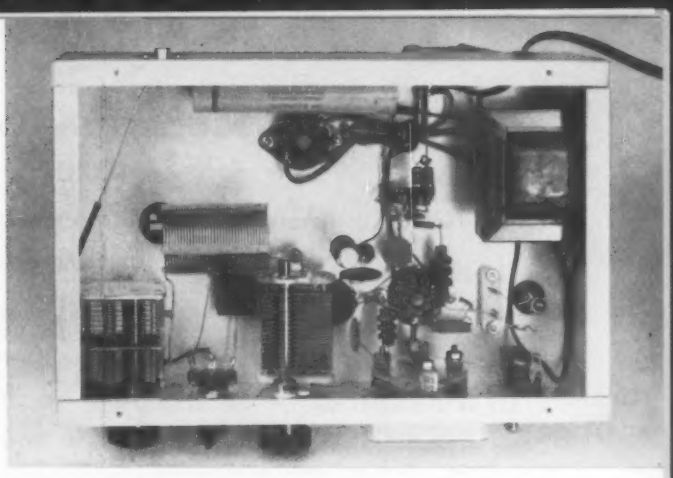
Although there is no rule about what should be

[2] McCoy, "How To Solder," *QST*, Sept., 1958.

Fig. 1—Circuit diagram of the Novice 50 watter. Unless otherwise specified, capacitances are in μμf. Capacitors marked with polarity are electrolytic. Capacitors not otherwise identified are disk ceramic.

C_1—470-μμf. mica capacitor.
C_2—250-μμf. variable capacitor (Hammarlund MC-250M).
C_3—680-μμf. mica capacitor.
C_4—365-μμf.-per-section dual variable capacitor, broadcast-replacement type, sections connected in parallel (Allied Radio 60H725).
I_1—Dial lamp, 2 volts, 60 ma., No. 48 or 49.
J_1—Key jack, open-circuit.
J_2—RCA type phono jack.
L_1—35 turns of No. 18, 1¼-inch diam., 16 turns per inch, tapped 15 turns from the C_4 end (B & W No. 3019).
L_2—9-hy. 125-ma. filter choke (Triad C-10X or equiv.).
R_1—11,000 ohms 3 watts. (See text.)
R_2—50,000 ohms, 2 watts. (See text.)
RFC_1, RFC_2—1-mh. r.f. choke (National R-50, Millen 34300–1000).
RFC_3, RFC_4—2.5-mh. r.f. choke (National R-100S).
S_1—1-pole 2-position switch (Centralab No. 1460).
S_2—Single-pole single-throw toggle switch.
T_1—750 volts, c.t., 150 ma., 5 volts 3 amp., 6.3 volts, 4.5 amp. (Stancor PC-8411 or equiv.).





This view shows the arrangement of the components below chassis. At the far right, mounted against the side of the chassis, is L_2, the power-supply choke. The filter capacitors are mounted along the back wall. At the lower left is C_1, the output capacitor. The other variable is C_2.

wired first, it is a good idea to complete the power-supply wiring before tackling the r.f. When you mount the transformer on the chassis and see all the leads that can get in your way, you'll quickly understand why it is a good idea to do the power wiring first.

The screen voltage-dropping resistor R_1 consists of three 33,000-ohm 1-watt resistors connected in parallel, and R_2 is two 100,000-ohm 1-watt resistors in parallel. If desired, 10,000-ohm and 50,000-ohm 10-watt resistors can be used. The 100,000-ohm bleeder resistance across the output of the power supply (shown on the diagram as 100K, 5 watts) is made up of three 33,000-ohm 2-watt resistors in series.

On the 6146 socket the three cathode pins, 1, 4, and 6, should be connected together and the leads from C_1 and RFC_2 should be soldered to any of the three pins.

On S_1, the center terminal connects to the stators of C_4. The 40-meter tap from L_1 goes to one outside terminal on S_1, and the mica capacitor C_3 goes to the other terminal.

Operation

After completing the wiring, check all connections to make sure you haven't made a mistake. When you feel you are ready to try the transmitter, plug in the key, an 80-meter crystal, the line cord, and turn the power on. Leave the key open until the 6146 warms up. Oh yes, you probably won't be putting an antenna on the rig until you're sure it works, so you'll need a dummy load connected to the output terminals. A 40-watt light bulb makes a good load, the threaded portion connecting to the chassis ground and the base pin to the output lead.

Switch S_1 to the 80-meter position and set C_4 at maximum capacitance (plates fully meshed). Close the key and tune C_2 for a "dip" in meter reading. Once you've resonated the tank circuit by tuning C_2 to a dip, you may or may not find that the lamp lights. Also, the meter reading at the dip will probably be only 20 or 30 ma. By decreasing the capacitance of C_4 and redipping with C_2 you'll find that the lamp will get brighter and the loading heavier, as indicated by an increasing meter reading at the dip point. Be careful not to hold the key down any longer than necessary with the 6146 out of resonance as the tube is easily damaged during such operation. Increase the loading until the meter reads 100 to 125 ma. at the dip. This will be an input of approximately 50 watts, and the dummy load should be fairly bright. Under these conditions you should have approximately 400 volts on the plate of the 6146 and roughly 150 volts on the screen. Use an 80-meter crystal for 80-meter operation and a 40-meter one for 40. It is possible to use an 80-meter crystal for 40-meter work, but the oscillator will be operating as a frequency doubler and the output is less than when operating straight through at the crystal frequency.

No matter what type of antenna you plan to use, it is very important to take precautions to prevent harmonic radiation. This is particularly true of the second harmonic from 3.7-Mc. operation. As it stands, the transmitter will not provide adequate suppression of the second harmonic to assure that the user will stay out of trouble with the FCC. (Don't think this rig is unique in this respect; *all* transmitters have the problem of harmonic radiation). The answer is simply to use an antenna coupler,[3] preferably link-coupled, between the antenna and transmitter. Such a coupler will provide adequate second-harmonic attenuation and you won't be in danger of receiving a "QSL" from the FCC.

As far as TVI is concerned, there are only a few spots in the country where television interference would be a problem with the rig described here. While it is possible to have harmonic TVI from 80- to 40-meter operation, such cases of interference are rare. If you should experience such interference with the rig as described, it then would be necessary to put a shield over the 6146, install a bottom plate on the chassis, and use a low-pass filter.[4] This should eliminate all chances of TVI from the transmitter.

[3] Complete details for construction and use of antenna couplers are given in *The Radio Amateur's Handbook*, Transmission Lines chapter.

[4] See *The Radio Amateur's Handbook*, BCI-TVI chapter, for construction and use of low-pass filters.

Wide-Band Moderate-Power Dummy Loads

Good High-Frequency Performance with Wire-Wound Resistors

BY DAVID T. GEISER,* WA2ANU

"Noninductive" wire-wound resistors are capable of handling more power than the composition types, but as a general rule are not sufficiently nonreactive to make predictable dummy loads at the higher frequencies. Here are some easily-built dummies using a simple method of reactance compensation, good for frequencies through the 144-Mc. band and transmitter power outputs up to 40–80 watts.

AMATEURS generally do not know how helpful a dummy load can be in the testing and adjustment of a transmitter. Commercial radio services use them for many purposes in ways that amateurs could imitate, and the purpose of this article is to discuss these uses and to show the construction of several adequate low-cost dummy antennas.

Several uses of the dummy antenna are tracing TVI, testing transmitters, testing s.w.r. bridges, and testing transmission lines. This makes a fairly complete list, but there are also other benefits, for familiarity with the effects that go into the design of a good dummy antenna makes the use of resistors at radio frequencies a much less frustrating affair. Limiting the discussion to resistors that will handle some power and that amateurs can afford simplifies the discussion and allows space for both construction and theory talk.

Wire-Wound Resistors

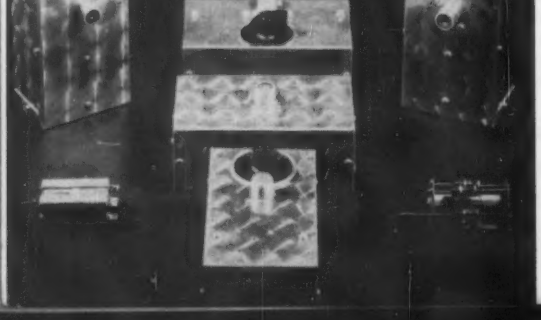
When power resistors are mentioned, the natural first thought is the wire-wound style that has been used so long for bleeder and voltage-dropping purposes. These resistors are available in a wide range of values, from a few ohms to thousands of ohms, in power ratings of a few watts to over 250 watts. Most of them are not satisfactory for easy r.f. use, being wound like an ordinary tuning coil, one turn beside the other, all in the same direction. There is, however, one type of resistor [1] made with a ceramic-insulated wire that permits winding layers on top of each other in opposed directions, without shorting turns. These relatively inexpensive resistors were used in the dummy antennas to be described because of their availability and fairly good frequency characteristics. While of a type called "non-inductive," these resistors (like any other component) will show capacitance and inductance as part of their impedance. Their use is usually limited to a few megacycles if neither inductance nor capacity effects are permissible.

There are other types of resistors, some better and some worse for use at radio frequencies. The better resistors are usually of the film type (a metal film deposited on glass or some other insulator) but are more expensive and harder to obtain. Commercial dummy antennas use this form of resistor successfully to frequencies higher than 3000 megacycles, but the cost for power ratings as high as the units described here may be ten to twenty times greater.

Many other types of resistors have been used for dummies, the most common probably being the incandescent light bulb. While the light bulb certainly does change r.f. energy to heat, it shows drastic change of resistance with different power inputs. The ordinary light bulb, cold, has only 7 to 10 per cent of the resistance it has at normal operating temperature. Thus in the course of transmitter tune-up a 100-watt bulb might change from a value of 10 to 130 or more ohms. This is probably the most frustrating thing that can happen when it is desired to check changes in adjustments. (*Something* must stay constant to permit a comparison between two conditions.)

* 202 Genesee, New Hartford, N. Y.

[1] Sprague Products Company NIT and NIS series.



Some of the wide-band dummy resistors developed in the course of the investigation. (Left to right, back row, 100 to 180 Mc., 0–80 Mc., 30–80 Mc.; center, composite 0–175 Mc.; front, 300-ohm 50-Mc. balanced, early 0–80 Mc., 100-ohm experimental.

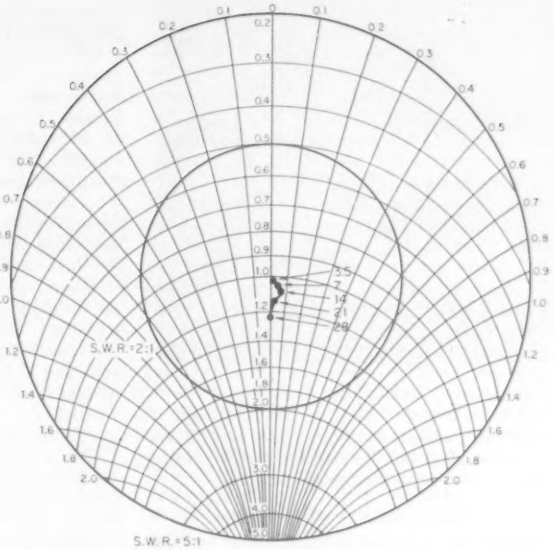


Fig. 1—Impedance characteristics below 30 Mc. of the dummy shown in Fig. 2; capacitor dial set at 30 (100-division scale, with zero at minimum capacitance of the HF-50 capacitor used). This and the other charts in this article are presented in the form of Smith charts, with the actual impedance values normalized to the design value (50 ohms in the case above). Points in the area to the right of the vertical axis represent impedances having an inductive component; those in the left-hand area are capacitive.

A much better dummy was described by Grammer a few years ago using the heating element of a flatiron.[2] The r.f. characteristics were fairly good, but the resistance was quite low and a matching network was required to bring it up to a desired level. This required major retuning for each band. Occasionally other dummies have been described or offered for sale, but there is usually high cost, little application data, or poor availability.

With these items in mind, an examination was made of the possibility of a home-assembled dummy antenna that had predictable characteristics. While working for Sprague, I had had many ham questions on the Sprague Noninductive Koolohms referred to me. Repeated measurements showed that the most constant r.f. values were obtained in the 200-ohm units in any wattage range. I do not know why this particular value is more predictable in the megacycle region; it merely is. The resistance is fairly close to the d.c. value, with little reactance, near 3.5 megacycles; but inductive effects and a rising resistance appear by the time 7 Mc. is reached.

[2] "Adjustable Dummy Antennas," *QST*, March, 1951.

Wide-Band Compensation of Inductance

The resistors were measured on a Boontoon RX Meter giving r.f. readings of parallel resistance and capacitance. (If an item was inductive, capacitance was added; if capacitive, capacitance was subtracted.) It was early observed that the necessary added capacitance stayed quite constant to 14 Mc. and only dropped moderately going to 30 Mc. Resistance rose somewhat, but not enough to be seriously objectionable in terms of s.w.r. A mathematical cause was found for this action (see Appendix) and it was found experimentally that a fixed parallel capacitor could do a fine job of compensation through 30 and perhaps 60 Mc., depending on the dummy requirements.

The rising resistance characteristics were also put to work. All experimental investigation was aimed at a 50-ohm dummy made from 200-ohm 10-watt noninductive Koolohms, so since the resistance rose approximately 50 per cent at 50 Mc., six resistors instead of four were paralleled, resulting in an effective dummy between 30 and 80 Mc.

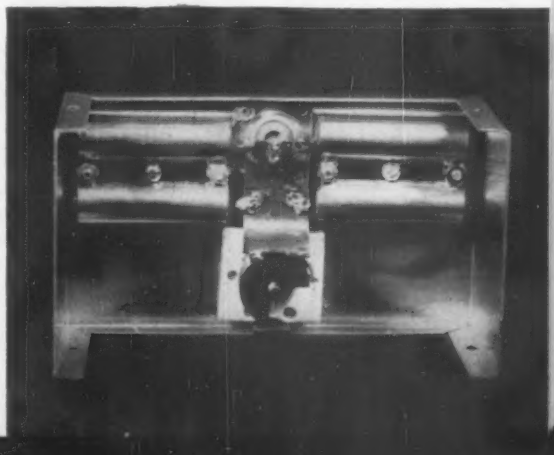


Fig. 2—Zero to 30 Mc. dummy using special resistor holder (see text) and shunt variable capacitor compensation. Note copper sheet connecting resistors to variable capacitor and coax connector. Resistors are grounded at outside ends. This dummy is useful to 80 Mc. (v.s.w.r. = 1.6) with the capacitor set at 18.

At this point, Sprague Products Company President Harry Kalker became interested in the project and had some special resistor-twin-holders made for the resistors.[3] The holder capacitance with one end of the resistor grounded was just sufficient to make the resistor bank of six become fairly well compensated from 30 to 80 megacycles. At lower frequencies, the bank of four was equally well compensated.

Going much above 70 Mc., the resistors began to look capacitive, so a series inductance in the form of a hairpin was added. This cancelled much or all of the capacitive effect and permitted use of a shunt capacitor at the terminals to cancel the inductive effect and step up the apparent resistance. Actually all that is being done in this form of the dummy and the other dummies is to find the effect of frequency on the resistor and then find some simple way of correcting for it. There's no magic involved — just a process of measuring, figuring, and trying. Fortunately, the results seem reproducible and the designs may be duplicated without further thinking.

Construction and Results

The first thought was that the dummy resistors had to be able to dissipate safely a reasonable amount of power. Power is generally an *average* effect over a brief period of time, for it takes time for any object to heat to the danger point. The Koolohm construction is good under overload and these resistors may be run for thirty-second periods at twice rated power without damage if they are allowed to cool to room temperature before further use. (It should be stated that "Koolohm" is a trademark and that the resistors generate the same number of heat calories as any other resistor at the same power.) The power rating for each resistor, therefore, is ten watts continuous and twenty watts for thirty-second periods. Thus a bank of four would have a rating of 40 watts continuous and 80 watts for 30 seconds. Higher powers could probably be used for briefer periods, but there is no data on this. The metal resistor clamps are not believed able to increase power ratings, for what is gained in heat dissipation is considered lost by having other resistors close by.

Capacitors used in compensation are required to carry fairly high currents at the higher frequencies. While many excellent fixed capacitors are made, their "special order" nature and resulting high cost made use of a variable air capacitor desirable. The Hammarlund HF-50 was chosen as being generally available at reasonable cost.

To be widely useful, a dummy should be shielded. No really good shield boxes seem generally available, so the Bud 3006 Minibox was chosen as it had enough volume to permit easy layout and was small enough to be wrapped in aluminum foil when additional shielding was necessary. Extra screws were added to some of the dummies to improve shielding but were inadequate for really critical use such as TVI testing.

Last, but very important, is the type of wiring used. Generally, sheet copper was used to make connections because wide conductors have much less inductance than round wires. The sheet conductor has another useful characteristic: an amazing percentage of the resistor heat can leave by way of the leads, and if the resistors are

[3] It is not known at this time whether these will be sold, but they can be duplicated electrically by wrapping all but one end of each resistor in aluminum foil.

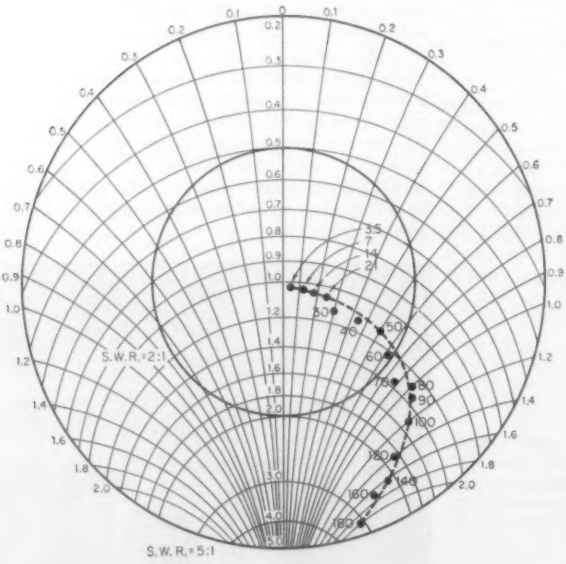


Fig. 3—Impedance characteristics of a Sprague 200-ohm 10-watt noninductive resistor parallel with and ⅛ inch from a ground plane, with ¼-inch leads and one end grounded. Values normalized to 200 ohms.

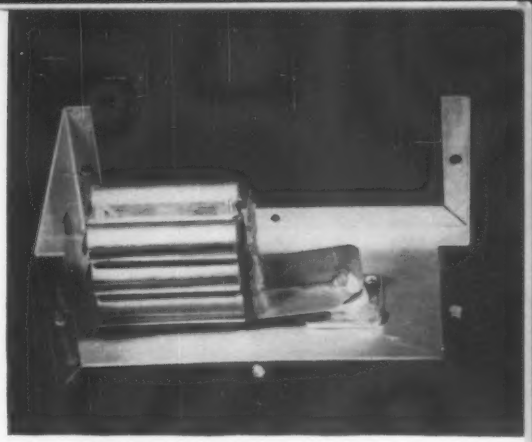


Fig. 4—Thirty to 80 Mc. 50-ohm dummy resistor. Note the use of six paralleled 200-ohm (nominal value) resistors to obtain 50 ohms.

connected by very short leads to a large *area* of copper they operate much cooler.

The first dummy built was intended to cover the range from d.c. to 30 Mc., and the happy results obtained are plotted on the impedance chart of Fig. 1, where the results are expressed as fractions of the desired 50 ohms. Layout seems uncritical, for a later dummy (Fig. 2) with a different layout duplicated these results even to the readings of the compensation capacitor. Incidentally, each of the points under 30 Mc. may be perfectly compensated for reactance by resetting the compensation capacitor.

A fuller understanding of the characteristics of the resistor alone is necessary when aiming at higher frequencies. Measurements without a shield are presented in Fig. 3. This result was obtained with a single resistor tested with one end grounded and the body mounted about ⅛ inch from a grounded sheet of metal, lead length being about ¼ inch. Here it is apparent that the resistor appears inductive, with increasing resistance to the upper limit of measurement.

As earlier hinted, the easiest way to compensate for the rising resistance is to pretend that it is not there by paralleling larger numbers of the resistors. Thus, in the dummy of Fig. 4, six resistors are paralleled (instead of four) to give a "50"-ohm resistance in the vicinity of 50 Mc. The capacitance supplied by the resistor holders (or foil wraps if the holders are not available) does a quite acceptable job of reactance cancellation (Fig. 5), although if perfect reactance cancellation is required, the values shown in the table accompanying the figure may be used.

Aiming at still higher frequencies (100 to 180 megacycles), extremely high resistances must be transformed down to the vicinity of 50 ohms. While impedance matching networks may be used having lumped capacitors and inductors, an attempt was made to see whether good compensation could be obtained with just a piece of wire used as a transmission line (Fig. 6). The characteristics resulting are such that, without further compensation, an acceptable dummy is produced between 100 and 135 megacycles (Fig. 7). Added capacitive compensation will take care of frequencies to 170 megacycles.

The use of capacitive compensation may strike some readers as being either cumbersome or expensive. Actually, capacitors are probably the least expensive and most predictable adjustable energy storage devices. The use of shunt capacitive compensation as advocated in this article

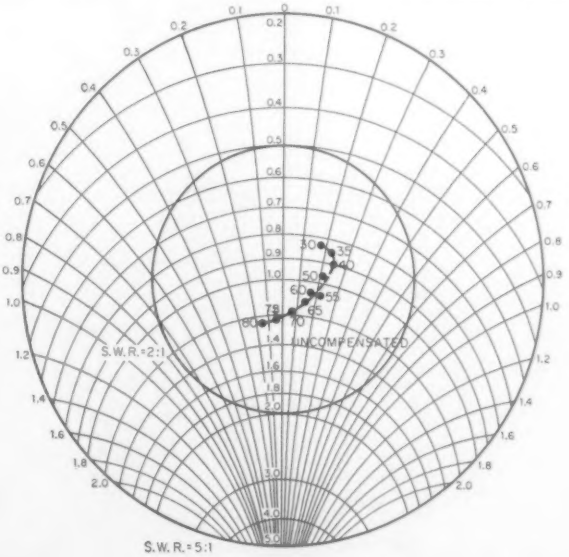


Fig. 5—Impedance characteristic of the 30–80 Mc. 50-ohm dummy without further compensation. The shunt capacitance required for complete cancellation of the reactive component of the impedance is as follows:

Frequency, Mc.	Capacitance, $\mu\mu$f.
30	27.9
35	26.5
40	21.1
50	13.8
55	10.8
60	6.4
65	5.3
70	2.7

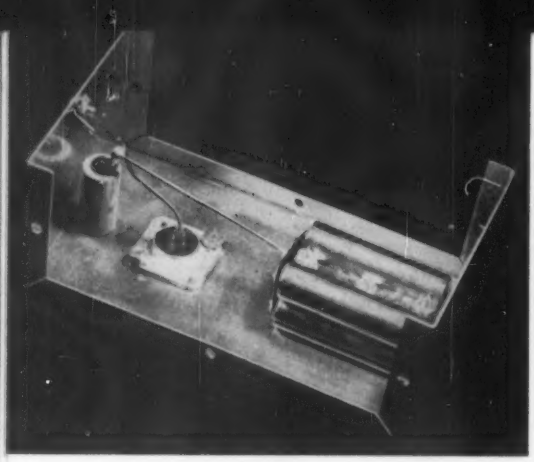


Fig. 6—Dummy for use between 110 and 170 megacycles. Note the "hairpin" of wire that provides impedance transformation of actual resistance to a value nearer 50 ohms.

permits use of a grounded-rotor capacitor such as the common variable, with attendant ease of mounting and freedom from hand-capacity effects. Small capacitors should be used, naturally, for large capacitors do have a tendency to look like transmission lines at high frequencies.

Composite Resistors

Composition resistors as well as wire-wound types were investigated in the search for a good dummy. The major drawbacks of the type commonly available are inability to handle high power and, particularly in the high-resistance ranges, decreasing resistance and an increasing capacitive reactance.

Plotting the radio-frequency characteristics of these resistors in the fashion of the dummies, it became apparent that over a very wide frequency range composition resistors exhibited almost exactly opposite variations to the noninductive wire-wound variety. The obvious step was to parallel composition and wire-wound resistors. This was initially done with a single 200-ohm 10-watt noninductive wire-wound resistor and five 1000-ohm 2-watt composition resistors to make a 100-ohm nominal 20-watt resistor. The composite resistor still exhibited a small amount of inductance at thirty megacycles, but this was easily compensated by the addition of 1.1 $\mu\mu$f. in parallel in the form of two small series NP0 ceramic capacitors.

The final form of the composite dummy was a 50-ohm 40-watt unit (Fig. 8) constructed in the standard case selected for this series of dummies. Good characteristics resulted (Fig. 9) although it should be emphasized that composition resistors are sensitive to power overloads, so such a combination should not be run at more than half of the total wattage if close long-term stability is desired. If less than the best stability is satisfactory, full rated power may be run for fifteen seconds or so at frequencies under 30 megacycles.

Use of Dummy Resistors in the Ham Station

Most hams wrongly think of a dummy as a seldom-used device whose only purpose is to burn up unwanted power. Instead, dummy resistors, dollar for dollar, are probably among the most useful station accessories, next to a monitor and s.w.r. bridge.

Dummies should be used to check a transmitter before putting it on the air. This is commonly done by connecting to the transmitter a dummy whose impedance is near the actual antenna or

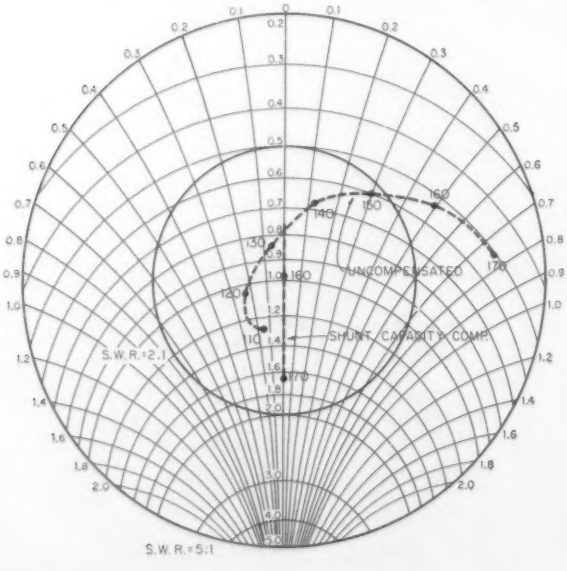


Fig. 7—Impedance characteristics of the 110–170 Mc. 50-ohm dummy, with and without capacitive compensation. Required values of compensating capacitances are as follows:

Frequency, Mc.	Capacitance, $\mu\mu$f.
140	5.4
150	14.3
160	19.0
170	17.1

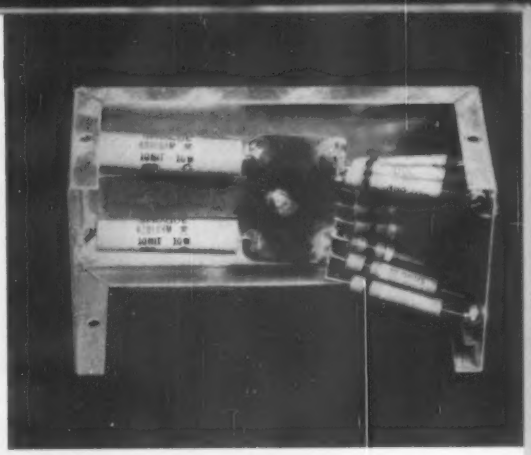


Fig. 8—Composite 50-ohm dummy made up of two 200-ohm 10-watt noninductive wire-wound resistors and ten 1000-ohm 2-watt composition resistors. The tongue between the wire-wound resistors may be bent to furnish capacitive compensation. The coaxial connector is under the copper sheet.

transmission line input impedance. In the case of first-time operation of a transmitter, this is obviously necessary to prevent an unexpected load from resulting in damage to the equipment. The average amateur should use this dummy to peak up each transmitter stage at an operating frequency before attempting transmission, as well as for experimentation. Those with small children will also find it useful to reset disturbed dials correctly when curious fingers have "worked with radio like Daddy." In any case, the law requires (Section 12.151) that ". . . each amateur station shall be operated with good engineering and good amateur practice," and good engineering practice prohibits putting an unnecessary signal on the air.

TVI investigation requires the use of a dummy antenna that is well shielded, for harmonics leaking out of a poorly shielded dummy can cause TVI as easily as harmonics leaking out of a poorly shielded transmitter. Any of the dummies described in this article *if well wrapped in aluminum foil* are as tight to r.f. as the best transmitters can be expected to be. If such a dummy is used for the transmitter load and TVI persists, interference power is leaking through the transmitter case or coming out on key, mike, or power leads.

Coaxial cable is often suspected of breaks when used to feed an antenna that loads poorly. A dummy placed at the far end of the cable will show a low s.w.r. and normal loading on a good piece of cable, while either open or shorted cable will have a high standing-wave ratio.

Antenna s.w.r. bridges are readily checked with dummy resistors. Frequently an antenna bridge (being a new and expensive piece of station equipment) is first suspected when an unusual loading condition is encountered. Use of a dummy load instead of an antenna rapidly answers the question, for a bridge showing a low s.w.r. on the dummy is good and the trouble is elsewhere.

Summing up, a dummy will not necessarily produce a better or stronger signal, but it will make attaining a good strong signal a quick, easy and legal job.

Acknowledgments

This work was done while the writer was an employee of Sprague Electric Company and their assistance and that of Sprague Products Company is acknowledged and appreciated.

(*Appendix on page 180*)

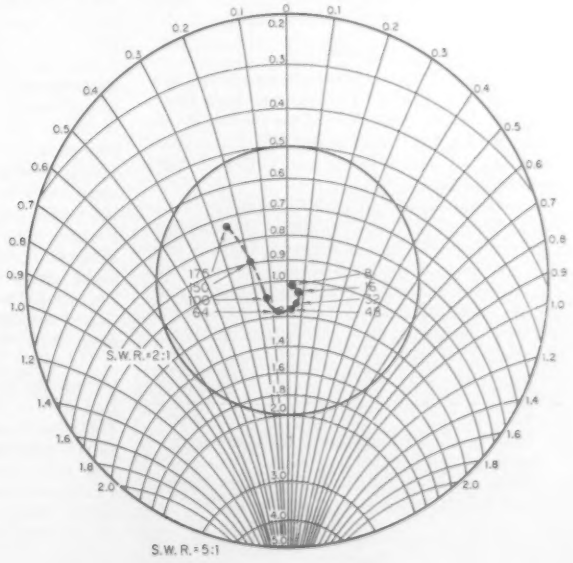
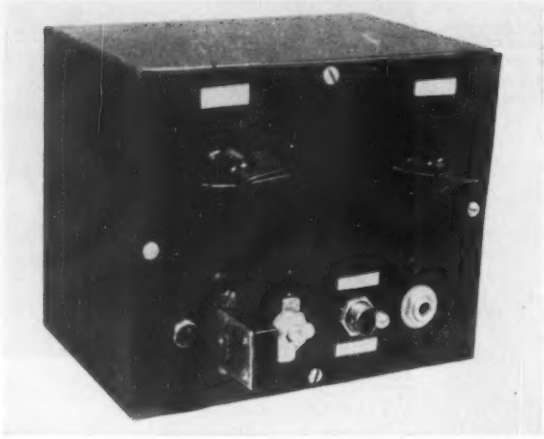


Fig. 9—Impedance characteristics of the composite 50-ohm dummy resistor pictured in Fig. 8. Wide-band characteristics of this dummy permit its use from zero to 175 Mc. in most applications, though care must be taken to avoid overload.



An input of about 10 watts can be run to this compact mobile rig on 80 or 40 meters. Along the bottom of the panel are the resonance-indicator lamp, change-over switch, tune switch and microphone jack. Above are controls for the tank and loading capacitors.

Two-Tube Mobile Transmitter

Simple Job for 80 or 40

BY M. J. WESTREM,* WØHOB

Although this transmitter contains only two tubes, it is a complete mobile transmitter, including the modulator. Power input to the final runs about 10 watts. The transmitter is designed to use the B+ voltage from the car's receiver. It can be built with a minimum outlay of money, time, and effort. Its small size greatly simplifies installation problems. As for performance, reports received have been very complimentary, and gratifying. The stations worked report that audio quality is excellent.

Circuit

The circuit of the transmitter is shown in Fig. 1. One half of a 12AT7, V_{1A}, is used in a Pierce oscillator circuit. The plate of the oscillator uses a 15,000-ohm load resistor instead of the usual r.f. choke, as it was found that sufficient drive was obtained.

The oscillator is capacitively coupled to the 6CL6. The output tank circuit is of the pi-net type, to assure tight coupling to the antenna. With the type of modulation used in this transmitter, it is necessary that the transmitter be heavily loaded to maintain good audio quality.

The other half of the 12AT7 is used as a screen modulator. In this circuit, the plate is grounded for audio, but it is not a cathode follower since the input signal is applied from grid to cathode, not grid to ground. The carbon microphone obtains its voltage from the car battery. The battery and resistor R_1 are bypassed for audio by the 100-μf. capacitor C_6. The microphone is coupled through a microphone transformer to the grid of the 12AT7. The 330-ohm resistor in the cathode circuit is to obtain the required bias on the modulator, and apply the proper screen voltage to the 6CL6. (The modulator plate and the amplifier screen are in series for d.c. and the screen voltage depends upon the d.c. drop across the modulator tube.) This resistor is by-passed for audio by the 10-μf. capacitor. No modulation control is provided; if one is desired, a 250-ohm variable resistor could be substituted for R_1.

One pole (S_{2A}) of a d.p.d.t. switch is wired so that in the tune position (switch closed) the normal operating voltage is applied to the screen of the 6CL6. The other pole (S_{2B}) couples the tuning indicating lamp I_1 into the circuit. A s.p.s.t. switch may be used, and the indicating lamp left wired in the circuit permanently. The tuning lamp was used in place of a milliammeter because when the transmitter is tightly coupled to the antenna, the dip at resonance becomes very slight and it is difficult to tell when the final is resonated. The tuning lamp gives a better indication of resonance, is much more economical, and requires less space on the front panel.

The relay K_1 switches the antenna from the transmitter to the receiver. It also switches the B+ voltage from the transmitter to the receiver. Fig. 1 shows filament connections for both 6- and 12-volt systems.

If your car is one of the newer ones that has a radio with no high-voltage supply, any power supply that is capable of delivering between 200 and 300 volts at 90 ma. will work.

* Garner, Iowa.

Here's a little mobile rig that you can operate from your car radio's power pack. It costs but a few dollars and can be put together over a week end.

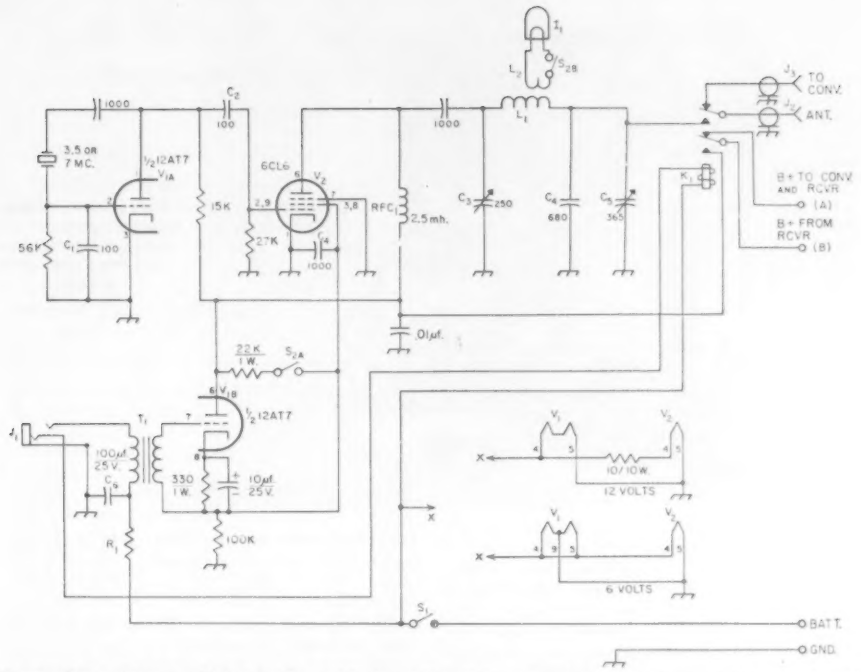
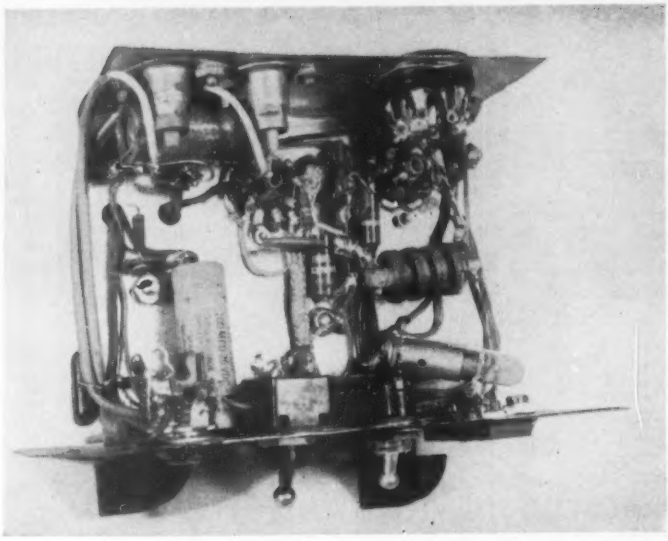


Fig. 1—Circuit diagram of the two-tube mobile transmitter. Unless otherwise indicated, capacitances are in μμf., capacitors marked with polarity are electrolytic, C_1, C_2 and C_4 should be mica or low temperature-coefficient ceramic; other fixed capacitors may be disk ceramic; resistors are ½ watt and resistances are in ohms.

C_1, C_2, C_4—See above.
C_3—225- to 250-μμf. variable (Bud Mc-1859 or equiv.).
C_5—Broadcast replacement variable.
C_6—Electrolytic—If battery positive is grounded, negative terminal of C_6 should go toward R_1; if battery negative is grounded, positive terminal of C_6 should go toward R_1.
I_1—60-ma. dial lamp.
J_1—Double-circuit microphone jack.
J_2, J_3—B.c. antenna connector.
K_1—6- or 12-volt d.p.d.t. miniature relay, depending on battery voltage.
L_1—32 turns No. 20, 1-inch diam., 2 inches long (B & W 3015 Miniductor or Air Dux 816).
L_2—1 turn insulated wire around L_1.
R_1—50 ohms 1 watt for 6-volt systems; 150 ohms 1 watt for 12-volt systems.
RFC_1—National R-100 or similar.
S_1—S.p.s.t. toggle switch.
S_2—D.p.s.t. toggle switch.
T_1—Single-button carbon microphone transformer.
V_1—12AT7.
V_2—6CL6.

The pi-network tank coil is suspended, by its leads, between the input and output capacitors, and above the antenna relay. At the rear of the chassis are the microphone transformer, 12AT7 and 6CL6. Connections to antenna, converter input, and power supply are made via the jacks on the rear apron of the chassis.



Bottom view showing control switches, resonance indicator lamp, and other small components.

Construction

Layout of the major components can be seen from the photos. The complete transmitter is housed in a 5 × 6 × 4-inch utility cabinet. The tuning-indicator lamp is mounted under the chassis, behind the panel, in such a position that it shines through the jewel mounted in the panel.

The parts mounted on top of the chassis are the relay, microphone transformer, tubes, final tank coil, and the tuning and loading capacitors.

Ordinary car-radio antenna connectors were used as input and output connectors. Short pieces of coax cable are used between the relay and these connectors.

A 6-prong tube socket is mounted on the back for making the necessary connections to the receiver. Only 4 of these pins were used, so a 4-pin socket could be substituted.

The power supply of the receiver will have to have some slight modification, as shown in Fig. 2. This consists of removing the B+ lead from its load in the receiver, and bringing both the B+ lead and the load connections out.

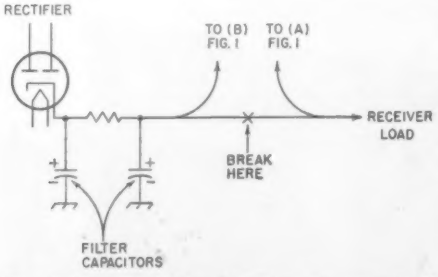


Fig. 2—Diagram showing alterations in car-receiver power-supply wiring.

Tuning

The coil data given here is for the 75-meter band; however, this transmitter can be used on 40 meters merely by using a 40-meter crystal, and changing the final tank circuit to 40 meters.

To place the transmitter in operation, insert a crystal of the desired frequency in the crystal socket, turn on the transmitter, and allow it to warm up. Turn the TUNE-OPERATE switch to the TUNE position. Adjust the loading capacitor to maximum capacitance (plates fully meshed). Next, key the transmitter with the push-to-talk switch on the microphone, and adjust the tuning capacitor until the tuning-indicator lamp lights the brightest. Open the loading capacitor a little at a time while continuing to keep the final resonated with the tuning capacitor. It will be noted that as the loading increases, the brilliance of the lamp diminishes. Continue to increase the loading until a point is reached where any further loading has no effect on the brilliance of the lamp. Once you become accustomed to loading a transmitter with this type of indicator, it is quite easy. Whenever you change frequency, be sure to reload the final because, as stated earlier, the audio quality will suffer if the transmitter is not properly loaded.

Although no attempt has been made to operate this transmitter on the higher-frequency bands, it is felt that this could be done easily by using oscillator circuits designed for harmonic operation, and changing the final tank circuit to the band desired. Information on these circuits can be found in *The Radio Amateur's Handbook*.

A Simple Quad Antenna Support

Available Materials and Bolt-On Construction

BY JACK G. HOLLENBECK,* W6JIC

The electrical design of a beam is important, of course, but if you want the beam to stand up over a period of time you have to give considerable thought to the mechanical details. In this article W6JIC describes a logical Quad support that can be constructed with a minimum of tools.

AFTER a lot of thought, reading, looking and planning, I decided to build a beam. It had to be strong, durable and inexpensive. It couldn't have the wing span of a full-sized 20-meter beam, but the prospect of one of the shortened beams left me dissatisfied. And, to top it off, I'm one of those fellows who wants a thing to work without too much fuss or continual adjustment.

With a list of requirements like that, and from rag chews and reading the mail, I decided upon a cubical Quad antenna. The only complaints I ran into about this type of antenna were not about the antenna proper but about the failure of the element supports to maintain alignment and to stand up under severe conditions.

Bamboo fishing poles, a commonly used support, just didn't appeal to me. In this area they cost more than other materials, and the sun and weather will cause them to crack and collapse. Unless special precautions are taken, their natural tendency to bend over a period of time will cause a change in spacing and alignment.

The strongest (and cheapest) element support material I could find was electrical metallic tubing, known in the trade as thin-wall conduit or EMT. The only apparent drawback was the fact that it comes only in 10-foot lengths and, while this poses no problem on 10 and 15 meters, the diagonal for a 20-meter Quad runs about 25 feet. Some method had to be found to stretch the EMT a few feet. Telescoping was out of the question, since the various sizes of EMT do not telescope without using special bushings. I decided to "borrow" a little at the support and make up the rest by using hardwood dowels as extensions at the ends. By varnishing the dowels, they could double as insulators.

The final design, shown in Fig. 1, involves only sawing and drilling operations, and the usual "visit your local machine shop" instructions are not required. The entire assembly is bolted together, and just the ordinary wrenches and screwdrivers are needed for the assembly operations. If you're worried about fitting a $\frac{5}{8}$-inch diameter dowel into a piece of $\frac{1}{2}$-inch EMT, forget it; "$\frac{1}{2}$ inch EMT" has an i.d. of just under $\frac{5}{8}$ inch. A length of dowel was used between each pair of EMT sections to keep the EMT from collapsing when the bolts were tightened. The end dowel sections are held in place by several cadmium-plated $\frac{3}{8}$-inch No. 4 sheet metal screws.

Although the galvanized finish on EMT is very good, I used a coat of red oxide primer and two coats of good aluminum paint to protect against rust at the points where the EMT had been drilled and wherever steel hardware had been used.

The boom can be made of large ($1\frac{1}{2}$ or 2-inch EMT), provided a section is welded to it to give the proper length for 20 meters. EMT is readily available at most hardware and electrical wholesale houses, and it is very easy to handle. The usual hand tools found in most workshops will more than do the job.

(Dope on Quad dimensions and other particulars not discussed here can be found in the following *QST* references: "Technical Correspondence," June, 1958; "Technical Correspondence," April, 1958; Hall, July, 1957; Leslie, January, 1955. — *Ed.*)

* 3166 Bryant St., Palo Alto, Calif.

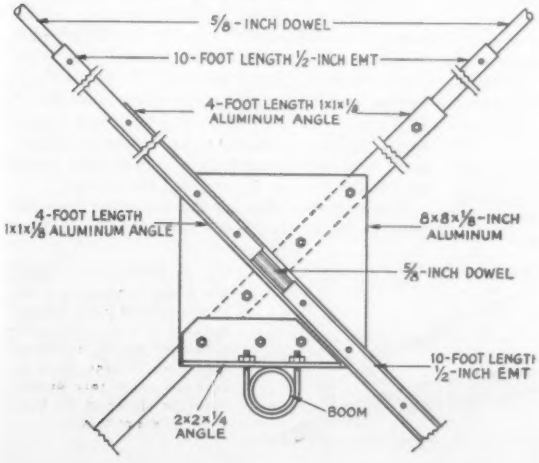


Fig. 1 — Details of the Quad antenna mount (one element). Two 4-foot lengths of 1 × 1-inch angle are bolted on opposite sides of the 8 × 8-inch plate. These angles each support two lengths of ½-inch EMT, and the final extensions (and antenna insulators) are lengths of ⅝-inch varnished hardwood dowel.

Working Ionospheric Scatter on 50 Mc.

DX When the Band Is Dead

BY JOE TAYLOR, JR.,* K2ITP

SAY, just how *does* one work that ionospheric scatter?" In past months the writer has been asked this question often. Many v.h.f. hams have read something about ionospheric scatter, and developed an interest in it, but have never really given it a try. They wonder if one must have a kilowatt to get into the game, or if a hundred watts will work. They wonder if one can use medium speed c.w., or even phone, or if scatter is strictly a 35-w.p.m. c.w. man's game. This article was written to answer some of these questions, and to try to get more v.h.f. men active in this intriguing phase of 50-Mc. communication. Picking up a new state or two, gathering a few extra section multipliers in a QSO Party to beat out the local competition, or just the thrill of working DX under normal conditions — these should be enough to give many v.h.f. men the urge to try scatter work on 6.

It might be well to begin with a few definitions. The terms meteor scatter and ionospheric scatter, often used interchangeably, do not mean the same thing. Meteor propagation is the burst-type of communication which avid two-meter men use to work new states during meteor showers. This type of signal is reflected from one *specific* spot in the ionosphere for each "burst," i.e., the ionized meteor trail. (See Fig. 1.) This phenomenon is similar to sporadic-*E* reflection, except that the reflecting medium is rapidly appearing and disappearing meteor trails, instead of a more permanent ionized cloud. If the meteor trail is ionized sufficiently to reflect the signal at the required angle, the received signal, in all likelihood, will not be very weak. It may not last too long, but even with less than 100 watts, the signals often reach S9 on 50 Mc., and 144-Mc. pings and bursts may be many decibels above the receiver noise.[1]

On the other hand, true ionospheric scatter signals are not reflected from any specific spot — they are truly *scattered*. (See Fig. 2.) Multiple reception paths exist frequently, causing signal levels to vary tremendously, with fast, fluttery QSB. These are the signals that are there when high power and good antennas are used, regardless of weather, solar, or meteor-shower conditions.

What Kind of Equipment?

You *can* work meteor skip on 50 Mc. with 50 watts — and don't let anyone tell you otherwise! The writer has had many meteor QSOs using approximately this power, especially during the better showers.[1] The more power you can put on, the more consistent your scatter QSOs will be. It is unlikely that powers under several hundred watts will produce the "background signal" of true ionospheric scatter, but if you rely on meteor propagation only (i.e., signal audible only on bursts), much lower power may be used.

In any event, the signal should be clean. This means no drift, no chirp, and no frequency modulation. Don't settle for anything less than a true T9X! Be sure to check your keying for clicks; bad key clicks can be as hard on your neighbors as overmodulation splatter. But don't make the keying too soft, either. The received signal will sound soft, anyway, because of the flutter. And remember, the lower your e.r.p., the more attention you must pay to these details. It is surprising what you can do with a *clean* 100 watts of r.f.

Reception of weak signals on 50 Mc. does not require a converter with an extremely low noise figure. Man-made noise is the limiting factor in urban areas most of the time. Even if a location is free of man-made noise, random "antenna noise" will be audible without going lower than about 5 or 6 db. in noise figure. There is only one way to make sure that your converter is good enough for your location: at a quiet time of day, disconnect the antenna from the converter and replace it with a carbon resistor equal to the line impedance. If the noise level is noticeably higher with the antenna than with the dummy load, then your converter passes the test. At the writer's location, which is not a particularly noisy one, 2 to 3 db. of antenna noise can be heard with a single 6AK5 r.f. stage in the converter. Lower noise figure would not help, and more gain would only make it easier to overload the mixer.

The receiver following the converter does not have to be in the 75A-4 class. It should have

* Taylor Lane, Riverton, New Jersey.

[1] For a detailed description of meteor propagation, and a calendar of Meteor Shower Data, see Bain, "V.H.F. Meteor Scatter Propagation," *QST*, April, 1957. Ionospheric scatter fundamentals were discussed by Moynahan in *QST* for March, 1956.

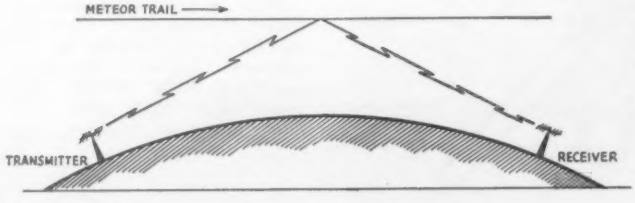


Fig. 1—Meteor burst signals are similar to sporadic-*E* skip in propagation path, but they last only as long as the trail is sufficiently ionized, usually not more than 20 seconds or so. Even low power may produce readable signals at the peak of the reflection.

good stability, and have a crystal filter, *Q* multiplier, or other means of obtaining fairly good selectivity. Restriction of the audio bandwidth is also helpful.[2]

The answer to the question of antenna size is similar to that of power level — the larger, the better — but you can get away with using something less than the best. From the writer's experience and correspondence it appears that long Yagis and stacked arrays with similar forward gains yield similar results on scatter. We don't want to start any arguments; you can believe this or not, as you wish. Just remember, you can't make them too big.

Remember, too, that although you don't need a full kilowatt, and you don't need the world's best receiver, and you don't need to have stacked long Yagis, if you compromise in too many places simultaneously you may compromise yourself right out of the scatter picture!

How To Communicate?

The actual method of exchanging information with the other station depends largely upon the power used and upon personal preference. As implied earlier, you won't get much of a true scatter background signal with powers under 300 watts or so. Therefore, if you run less than this, you should make your plans so as to make the best use of meteor bursts. This means that you want to get as much information as possible across in a short time. Consequently, medium- or high-speed c.w. will certainly help.

Low Power — You won't get much in the way of results by firing up your 100 watts and 4-element beam and calling CQ DX when the band is dead. Your best bet is to write to a 50-Mc. man in the area you want to work into, who you know is active on c.w. Set up a definite schedule with him, and use timed transmissions of one minute each way, or whatever you prefer. Be sure that you can spot each other's frequencies closely, for you won't want to waste any time tuning around. To make the best of short bursts, use keying speeds of 15–25 w.p.m., if you can. You will have to repeat plenty. Something like "WØXXX de K2ITP SNJ SNJ" repeated over and over has worked wonderfully for the author in QSO Parties. Even with low power, sooner or later (usually within 10–20 minutes) there will be a good burst, and your message will be copied. Repeat the process to get your "R's" across, and you've got a new section multiplier, or state, etc. It won't be the quickest QSO in the contest, but if it puts you one section multiplier up on the local competition it will be worth the time spent.

High Power — Suppose, on the other hand, that you're running upwards of a half gallon, and have stacked antennas or a long Yagi. Then you should have a bit of that consistent, fluttery background signal. Keying speeds will not be so important. At times 10 w.p.m. may be more copiable than 25 or 30, for it may not be "chopped up" as badly by the fast QSB. This, however, depends a great deal upon individual operators.

Timed transmissions will still be helpful, although if you find that your signals are audible most of the time, you can be much more lenient about the timing. The other guy will know when you sign, anyway.

You'll still need to repeat a good bit, unless you're better than the writer at copying fluttery signals. But now you have the satisfaction of knowing that you have set up a really consistent path for QSOs, regardless of band conditions for other types of propagation!

Voice and Scatter — It's a lot harder than using c.w., but you *can* use voice on 50 Mc. scatter. Quite a few phone QSOs have been made during the better meteor showers between stations running fairly high power. One good system is to repeat each sentence three times; with a little luck, fairly solid contacts may be made.

Getting rid of the carrier and one of the side bands helps a great deal. The writer recently made a series of weekly s.s.b. tests with W4IKK and W4RMU, in addition to our regular c.w. schedules. These tests were made in non-shower periods, when the band was dead. Power was 500 watts indicated d.c. input on s.s.b., and 700 watts on c.w. The s.s.b. was not copiable for the percentage of the time that the c.w. was, but plenty of calls, signal reports, "Good mornings," etc., were copied on s.s.b.

Conclusion

So, let's get out the key, write some letters, and give this 50-Mc. ionospheric scatter a try. Even if you aren't a contest man, and already have all the states within 1200 miles, it can be a lot of fun. This business of working 600–1200 miles without waiting for the band to open bears looking into, and you can do it!

[2] O'Hern, "Simple Low-Pass Filter Design," *QST*, October, 1957.

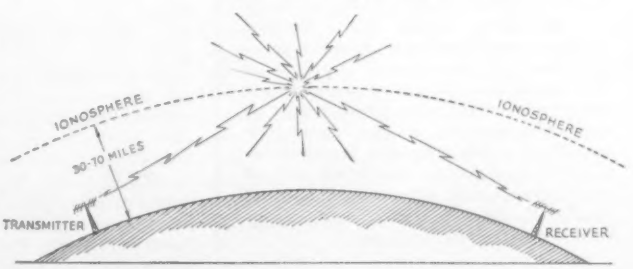


Fig. 2—If enough power is used a signal of readable strength is scattered from the ionosphere. Multiple reception paths are frequently apparent, causing rapid fading. Since the irregularities in the ionosphere that cause the scattering are always present, a consistent though weak signal is always available.

New Thresholds in V.H.F. and U.H.F. Reception

The World Below KTB

BY ROSS BATEMAN *, W4AO AND WALTER F. BAIN **, W4LTU

EVER since the first ham twiddled with the first coherer, we have been trying to improve our receivers. Now, with the coming of the maser and reactance amplifier, there appears to be a possibility of an improvement, and in an area where it will do the most good: the frequencies above 100 Mc. In a later article, we will discuss the details of these devices, but now let us back up a bit and consider just what limitations exist in the detection of weak signals and what these devices will buy us. Some of the factors involved are not readily apparent.

Most of us are familiar with the idea of noise figure, as simply a measure of how much worse our receiver is than the ideal receiver. The ideal receiver, in turn, is a device which adds no noise to that fed into it by the antenna.

Noise figure as measured on a noise generator has usually been a criterion of receiving performance, so let's start with it. Such a measurement has just been made and found to be quite good. We are now ready to go on the air so the receiver is connected to the antenna. If everything is matched, there is no reason to believe that the receiver noise figure is now any different, and it isn't. Now assume that the antenna is putting out vast amounts of noise which add to the receiver noise. Obviously, our ability to receive weak signals has suffered, but the noise figure remains the same. What, then, is the paradox? There is none. *Noise figure, as considered above, is a measure of the receiver alone.*

Apparently, then, noise figure as normally measured does not tell the whole story. To know where we stand, include the effects of the antenna and think in terms of an *over-all or effective noise figure*. Taking the liberty of one little equation, the relation of a new *over-all noise figure*, F_O, to the easily measured *receiver noise figure*, F_R, is readily seen:

$$F_O = \underset{\text{due to receiver}}{(F_R - 1)} + \underset{\text{due to antenna}}{N_A}$$

Note that the contribution from the receiver now appears as receiver noise figure minus 1. This unit of 1 was subtracted because it is not part of the actual receiver contribution, but simply the standard of comparison by which the receiver was gauged. It happens to be the thermal noise of the terminating resistor in the noise generator. The equation may be developed by starting with the receiver connected to the noise generator and measuring F_R. With the noise generator termination, the effective noise figure, F_O, is simply F_R. Now switch the receiver from the generator to the antenna, losing the one unit of noise caused by the termination and adding in its place antenna noise, N_A. Hence, F_O is now equal to $(F_R - 1) + N_A$. Note that in the above equation if the antenna noise is equal to one, we are back where we started and the over-all noise figure is equal to receiver noise figure.

However, in the more likely event that N_A is different than one, the over-all noise figure can be either greater than or less than the receiver noise figure. In fact, the *over-all* noise figure can even be less than one (negative db.'s), something not possible for *receiver* noise figure, which by definition includes one rather arbitrary unit of room temperature thermal noise. Thus, if antenna noise is much larger than the receiver noise, obviously we are stuck with it and little over-all improvement can be had by improving the receiver noise figure. For example, with a decent antenna, at 3.5 Mc., it doesn't matter much if the receiver has a 3-db. noise figure or a 6-db. noise figure. Atmospheric noise is so great that doubling the noise generated in the receiver is like adding two watts of additional power to a 500-watt transmitter instead of adding one watt. Your DX contact will never know the difference.

On the other hand, as will be seen, if antenna noise is much less than receiver noise, we really have something to gain by improvements in the front end. A 3-db. improvement in front-end noise figure can result in more than a 3-db. over-all improvement. Suppose that you have a receiver with a noise figure, F_R, of 2.5 (4 db.), and that antenna noise, N_A, is equal to 0.25. The over-all or effective noise figure is $2.5 - 1 + 0.25 = 1.75$ (2.4 db.). If the receiver noise figure is now reduced by 3 db. to 1.25 (1 db.), the effective noise figure becomes 0.5 (−3 db.), a net improvement of 5.4 db. This all seems to prove that sometimes a db. is not a db.

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Most amateurs are aware that spectacular advances are being made in r.f. amplifier design that promise markedly improved reception throughout the v.h.f. and u.h.f. portions of the spectrum. Here two well-known v.h.f. men who have been active in the development of the reactance amplifier show why the lower noise figures now being achieved are of such importance. A future article will deal with the practical aspects of the new amplifier techniques.

Since antenna noise is a vital factor in the problem, it is worthwhile to take a look at what causes it and what control, if any, we have over it. Antenna noise may be visualized to be thermal noise in a resistance, the radiation resistance of the antenna in question. Its magnitude is dependent not on the temperature of the physical structure of the antenna, but rather on the effective temperature of whatever the antenna is looking at. (Effective temperature is the product of the actual temperature and a radiation coupling factor.) Thus, the antenna may be considered to be nothing more than a thermometer whose output (noise) is proportional to its "temperature." When such an antenna looks at the open sky above 20 Mc.; we find that it registers an output corresponding to considerable temperature, depending on the direction and frequency in use. This is known as cosmic noise [1] and is the basis of radio astronomy. Fairly complete maps, plotted as power or temperature, have been made of this radiation from the sky, and it is of interest to note that they bear little relation to what we see in the sky visibly.

How intense is this radiation, and how does it vary with frequency? Fig. 1 shows a plot against frequency of the average cosmic noise level (average of all directions) and it can be seen that it is quite high in the h.f. region, has dropped to be equal to room temperature thermal (KTB) at about 175 Mc., and drops to quite low values at u.h.f. For convenience, figures are given in decibels, while the equation was in terms of power ratios.

It is of interest also to see how this noise varies across different portions of the sky at a given frequency. Fig. 2 shows a plot of the received noise that would be obtained at 144 Mc. with an antenna of 18° beamwidth scanning across the sky at a declination of −30°. (Declination is simply celestial latitude.) This particular sector gives a higher average than the entire sky, but was

[1] Below about 20 Mc., antenna noise does not consist exclusively of cosmic noise, but is largely caused by such unexotic sources as atmospherics, neon signs, electrical appliances, etc.

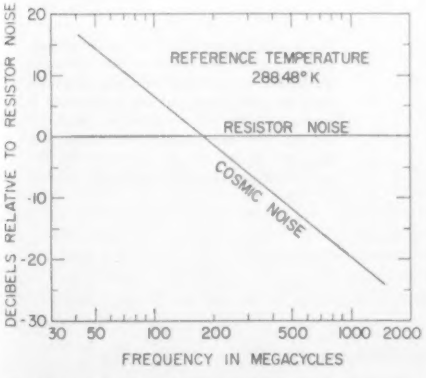

Fig. 1—Average cosmic noise variations with frequency.

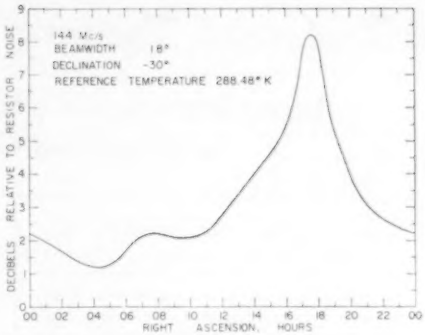

Fig. 2—Example of cosmic noise variation across the southern sky.

chosen to show that large variations in level are possible. It would not be necessary to rotate the antenna to obtain this curve, but rather the antenna could be fixed and readings taken over 24 hours while the earth rotates. This curve points up the importance of pointing toward the cold portions of the sky on frequencies where cosmic

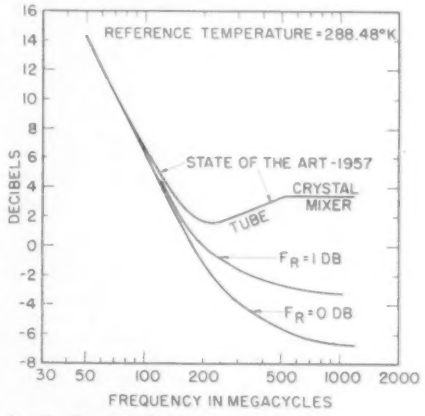

Fig. 3—Over-all effective noise figure for an antenna pointing at the horizon and average cosmic noise.

noise is the limitation, or of waiting until a cold portion is in the direction we wish to work.

We have now seen that overall sensitivity is strongly affected by antenna noise. We have also seen how this antenna noise varies with frequency and antenna direction. Now let us plug in some numbers and see what it all adds up to.

Fig. 3 is a plot of over-all effective noise figure (F_O) versus frequency and includes the effect of both the receiver noise figure (F_R) and the cosmic noise level (antenna noise), N_A. Three curves are shown, the top one assuming the best available tube noise figures below 500 Mc. (416B), and best crystal noise figures above 500 Mc. The middle curve indicates what may be expected with a 1-db. noise figure across the frequency range, and the lower curve gives the

(Continued on page 216)

•Technical Topics—

Input Impedance and Fed-Through Power in Grounded-Grid Amplifiers

Interest in the grounded-grid power amplifier has been high because the circuit offers one way to make use of otherwise-excessive power output from a driver. Another feature is low input impedance and the accompanying possibility of eliminating a tuned driver-coupling circuit. Simple methods of calculating the fed-through power and input impedance are discussed here.

THE operation of the grounded-grid amplifier circuit shown in Fig. 1A can be understood without much difficulty by making use of a simple equivalent circuit. The circuit at A is intended merely to be representative (even the d.c. feed arrangements have been omitted); any suitable coupling circuits could be substituted for the tuned circuit, L_1C_1, by means of which the driving power is applied to the grid-cathode circuit of the tube, and for the parallel-tuned output tank, L_2C_2. Also, it will be taken for granted in the following discussion that the plate-to-cathode capacitance of the amplifier tube is so low that no appreciable amount of r.f. energy can be fed through it either from the input side to the output side or in the opposite direction.

In the equivalent circuit at B the driver and coupling circuit L_1C_1 have been replaced by an r.f. generator, G_1, having an internal resistance R_1, and developing a voltage E_1 at its output terminals. E_1 is the r.f. voltage applied between grid and cathode in the actual amplifier. The resistance R_G is present to account for the grid losses in the amplifier under the chosen operating conditions — in other words, with E_1 applied to R_G the power lost in R_G is equal to the driving power (W_G) that would be needed if the tube were being operated in the familiar grounded-cathode circuit.

An equivalent generator, G_2, having an internal resistance R_2 and generating an r.f. output voltage E_2, also replaces the amplifier tube of Fig. 1A. E_2 is the r.f. voltage that appears between cathode and plate under the assumed operating conditions. In the third section of the equivalent circuit, R_L replaces the tuned tank circuit. R_L is the load resistance as seen by the amplifier circuit — the transformed (by the tank) value of the actual load resistance. The actual load may be a

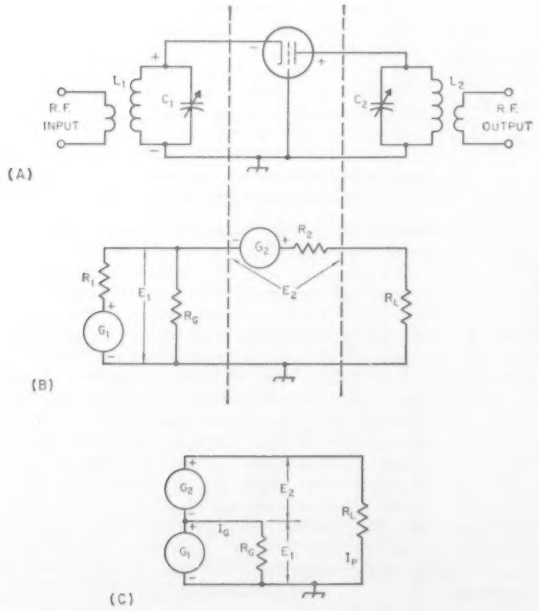

Fig. 1—Equivalent circuit of the grounded-grid amplifier. As shown in the simplified equivalent at C, the driver and amplifier may be considered as two generators in series with the power-consuming load resistance. The voltages of these two generators are in phase, as indicated by the instantaneous polarity signs on the circuits.

transmission line or any of the devices that commonly absorb or transfer power from transmitting circuits.

E_1 and E_2 are the terminal voltages, rather than the generated voltages, of G_1 and G_2, respectively. Under a given set of operating conditions they may be considered to be constant. When this is so the generator internal resistances R_1 and R_2 can be ignored. Thus the equivalent circuit can be simplified still further to the one shown at C in Fig. 1.

Equivalent-Circuit Operation

With this equivalent circuit it is readily possible to calculate both the total power required from the driver and the impedance of the amplifier input circuit as seen from the driver. Fig. 1C is obviously a rather simple Ohm's Law circuit. The power in R_L is supplied by G_1 and G_2 acting in series, thus the total r.f. voltage across R_L is the sum of E_1 and E_2. Since G_1 and G_2 are in series with R_L, the same r.f. current flows through all three. This current, which we will designate I_p, can be found from the known power output of the amplifier tube:

$$I_p = \frac{W_p}{E_2}$$

I_p is the effective value of the fundamental-frequency r.f. current that flows through R_L (not to be confused with d.c. plate current), and W_p is the rated output of the amplifier tube.

The power contributed by the driver to R_L (fed-through power) is

$$\text{Fed-through power} = E_1 I_p$$

The resistance seen by the driver — that is, the input impedance of the amplifier — is simply the driver voltage divided by the total r.m.s. driver current. The total driver current can be found easily, knowing the total driver power and the voltage E_1. The total driver power is the sum of the fed-through power and the grid losses in the amplifier (the "normal" driving power). Thus the total driver current is

$$I_p + I_G = \frac{\text{Total driver power}}{E_1}$$

The input impedance of the amplifier is then

$$\frac{E_1}{I_p + I_G} \text{ ohms}$$

In most cases, W_G will be fairly small compared with $E_1 I_p$; that is, considerably more power is fed through to the output circuit than is consumed in the grid circuit of the amplifier tube. For a given set of operating conditions, no more power is actually lost in the grid with grounded-grid operation than with grounded-cathode operation.

Fed-Through Power

The amount of fed-through power is controlled by the relationship between the grid-cathode driving voltage, E_1, and the tube output voltage, E_2. The larger the ratio of E_1 to E_2, the larger the proportion of the total output power that is supplied by the driver.

It follows that a tube requiring a relatively large driving voltage as compared with output voltage — that is, a low-μ tube, in the case of a triode — will have greater fed-through power than one (high-μ) that takes relatively little driving voltage. This assumes that both types operate at the same plate voltage and develop the same output power at the same plate current. It does not mean that the low-μ tube is "harder to drive" than the other, since both may have the same, or approximately the same, actual loss in the grid.

Also, for a given tube operating at a specified plate voltage, a choice of operating conditions that requires a larger driving voltage will result in a greater amount of fed-through power. If there is no limitation on grid bias the fed-through power can be increased simply by increasing the negative bias and increasing the driving voltage to give the same amplifier plate current. In general, this can be done only in Class C operation since the bias cannot be set beyond cut-off in the Class B amplifier.

In any given setup the amount of fed-through power depends on the actual plate loading as represented by the load resistance R_L. Within the normal limits of operating conditions as determined by, for example, desirable values of amplifier plate efficiency, increasing the loading (by reducing R_L) will result in more power being fed through, since heavier loading will mean increased I_p. The converse also applies. The relationship is not linear, however, since the amplifier tube does not generate a constant terminal voltage with varying load resistance; also, the optimum driving voltage depends on the loading so the driving voltage, too, should be changed when the load resistance is changed. Hence calculations are usefully accurate only when a specific set of operating conditions is selected.

Input Impedance

To a first approximation (neglecting the effect of grid losses) the amplifier input impedance is equal to E_1/I_p. Thus it will be larger if E_1 is increased while I_p is held constant, or will be smaller if I_p is increased while E_1 is held constant. In a general way, this means that if the plate current of a given amplifier tube is held constant while the grid bias and driving voltage are varied (assuming no marked changed in plate efficiency), high bias and high driving voltage will result in a relatively high input impedance, while small bias and low driving voltage will give a relatively low input impedance.

From this we can conclude that low-μ triodes and Class C operation will result in higher input impedance than high-μ triodes and Class B operation, other things being equal. It is apparent, too, that a low value of input impedance

will, in general, be associated with relatively low values of fed-through power.

These generalizations have to be hedged with the "relatively" and "other things being equal" qualifications, since much depends on the actual operating conditions and the characteristics of the amplifier tube used. They are good, however, for comparing amplifiers operating at the same plate voltage, plate current, and plate efficiency.

The grid loss, W_G, is not the major factor in determining the input impedance, but this does not mean that it is always — or even usually — negligible. Neither is it a constant element in the total driving power, since it will depend on the grid bias, driving voltage, loading, and the amplifier tube. It causes the input impedance to be lower than calculations based on fed-through power alone would indicate, since the r.f. grid current is added to the driver's contribution to the r.f. output current to make up the total driver current.

The input impedance, like the fed-through power, depends on the plate loading. Lighter loading means smaller I_p and hence higher input impedance, and vice versa. If a grounded-grid amplifier is used with the object of providing a reasonably good match for a coaxial line without a tuned input circuit, the operating conditions must be chosen appropriately and adhered to strictly.

Linear Amplifiers

So far, the discussion has been based on the assumption that E_1 and E_2 have fixed values determined by the choice of operating conditions. When the amplifier is a "linear" — i.e, one capable of amplifying a modulated signal without introducing appreciable distortion — both E_1 and E_2 can vary from zero to some predetermined peak-envelope value. (However, most other operating conditions, such as plate voltage, bias, tuning and loading, are held constant in linear operation.)

By definition, a linear amplifier is one in which the ratio between the output voltage and driving voltage is constant regardless of the amplitude of the driving voltage. That is, $E_2 = NE_1$, where N is a fixed number for any value of E_1 from zero to some maximum value determined by the permissible distortion at peak output. In the linear amplifier case E_1 is a modulated voltage, and because of the fixed ratio between E_2 and E_2, E_3 is modulated identically. The total output voltage, which is the sum of the two, is also modulated identically. Linear operation is accomplished by appropriate choice of operating conditions for the tube, these conditions being basically the same as with a grounded-cathode circuit.

In other words, the equivalent circuit is also valid in the linear amplifier case. The principal difference in the approach to finding numerical values is that the variability of R_G with driving voltage has to be included if a complete picture of the input impedance over a modulation cycle is wanted. However, the major advantage of the grounded-grid circuit as a linear amplifier lies in the fact that it has built-in "swamping" because of the fed-through power. Variations in input impedance tend to be minimized, as compared with grounded-cathode operation, because the percentage variation in the load on the driver is held to a relatively low value. It will usually suffice to base calculations on peak-envelope conditions. At lower levels of excitation the input impedance will rise, with most tubes, since the grid loss will decrease more rapidly than the fed-through power as E_1 is progressively reduced from the peak-envelope value. In any case, the maximum possible variation in input impedance can be found from the figure calculated from peak-envelope conditions with the grid loss included, as compared with a figure calculated by neglecting grid loss entirely and using only the fed-through power.

Practical Calculations

Most of the quantities used in the simple calculations outlined above can be found in data furnished by the tube manufacturers. Usually there is one conspicuous exception: the r.f. output voltage of the tube, designated E_2 in this discussion. An acceptable approximation to it can be found by the following method:

1) Find the d.c. plate voltage, grid bias voltage, and peak grid signal voltage from the selected set of published typical operating conditions.

2) Subtract the grid bias voltage from the peak grid signal voltage. The result is approximately the minimum instantaneous plate voltage, since recommended operating conditions usually will be based on equal values of peak positive grid voltage and minimum instantaneous plate voltage.

3) Subtract the result found in (2) from the d.c. plate voltage. The difference is the peak plate voltage swing.

4) Multiply the result of (3) by 0.707 to obtain the r.m.s. value. This is the figure to be used for E_2.

E_1 is of course the r.m.s. value of the grid signal voltage; that is, 0.707 times the peak grid

TABLE I

Published Operating Conditions	811-A *Class B**	811-A *Class C*	812-A *Class C*
Plate Voltage	1250	1500	1500	1500
Grid Bias, volts	0	−4.5	−70	−120
Peak Grid Voltage	87.5	85	175	240
Plate Current, ma.	175	156	173	173
Driving Power, watts	3.0	2.2	7.1	6.5
Power Output, watts	155	170	200	190
Calculated				
E_1, volts	62	60	124	170
E_2, volts	825	1020	985	975
I_p, amp.	0.188	0.166	0.203	0.195
Fed-through Power, watts	11.6	10	25.2	33
Total Power from Driver, watts	14.6	12.2	32.3	39.5
$I_p + I_g$, amp.	0.236	0.204	0.260	0.232
Input Impedance, ohms	252	284	477	733
Total Output, watts	167	180	225	223

* Values given are for one tube, taken from audio data.

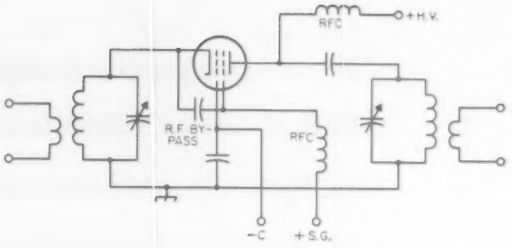

Fig. 2—Grounded-grid circuit in which the screen grid acts as an accelerator of electrons but does not otherwise take part in the amplification process. This corresponds to the part played by the screen in normal grounded-cathode operation, but when connected in this way the No. 2 grid does not act as a shield between the input and output circuits.

voltage usually given in the published data.

An 811-A operated as a Class C amplifier will serve as an example. Typical operating conditions as given by the tube manufacturer include the following:

Plate voltage	1500 volts
Grid bias	−70 volts
Peak r.f. grid voltage	175 volts
Plate current	173 ma.
Driving power (W_d)	7.1 watts
Power output (W_o)	200 watts

Using the above method of estimating, the minimum plate voltage is 175 − 70 = 105 volts, and the peak plate-voltage swing is 1500 − 105 = 1395 volts. Then

$$E_2 = 1395 \times 0.707 = 985 \text{ volts}$$

$$E_1 = 175 \times 0.707 = 124 \text{ volts}$$

$$I_p = \frac{W_p}{E_2} = \frac{200}{985} = 0.203 \text{ amp.}$$

$$\text{Fed-through power} = E_1 I_p = 124 \times 0.203 = 25.2 \text{ watts}$$

$$\text{Total power from driver} = 25.2 + 7.1 = 32.3 \text{ watts}$$

$$I_p + I_g = \frac{\text{Driver power}}{E_1} = \frac{32.3}{124} = 0.26 \text{ amp.}$$

$$\text{Input impedance} = \frac{E_1}{I_p + I_g} = \frac{124}{0.26} = 477 \text{ ohms}$$

$$W_{out} = 200 + 25.2 = 225 \text{ watts}$$

Notice that no use is made of the d.c. plate current in these computations. It was included in the list simply as a reminder that the loading must be adjusted to give this value of d.c. plate current in order that the calculated values of fed-through power and input impedance may be realized.

Table I shows the results of calculations of the same type on three sets of operating conditions for the 811-A and one set for the 812-A. Experimental measurements on setups using these tubes have verified the calculated values of fed-through power and input impedance.

When tubes are used in parallel the values (for one tube) of plate current, grid driving power, fed-through power, and power output should be multiplied by the number of tubes. The figure for the input impedance should be divided by the number of tubes.

Screen-Grid Tubes

The methods described above can be applied to published operating data for screen-grid tubes in similar fashion, provided the r.f. screen return is made to cathode rather than to ground, as in Fig. 2. However, this type of circuit has had little or no use in amateur transmitters, principally because it destroys the cathode-to-plate shielding that is essential for grounded-grid operation without neutralization. In the more commonly used circuit arrangements, shown in Fig. 3, the screen either is connected directly to the control grid, making the tube into a high-μ triode, or is operated with more-or-less normal positive d.c. screen potential but with the screen and control grid at the same r.f. potential. The latter arrangement is essentially low-μ triode operation.

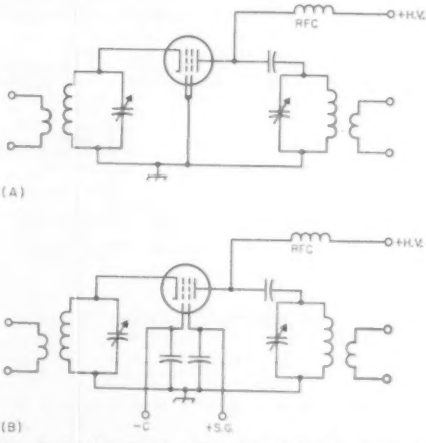

Fig. 3—Triode operation of screen-grid tubes in grounded grid circuits. In A the control and screen grids are connected together to operate as a high-μ control grid. In B, both grids are driven (with respect to cathode) by the same r.f. voltage but are operated with their normal d.c. bias voltages.

The same principles can be used in either case, but no operating characteristics are available from the tube manufacturers covering either type of connection. This is unfortunate, since there are more varieties of tetrodes than triodes in common use today. A tetrode in the circuit of Fig. 3B will allow feeding through comparatively large amounts of power from the driver, if that is a desirable consideration, as compared with the high-μ connection, and usually with less grid

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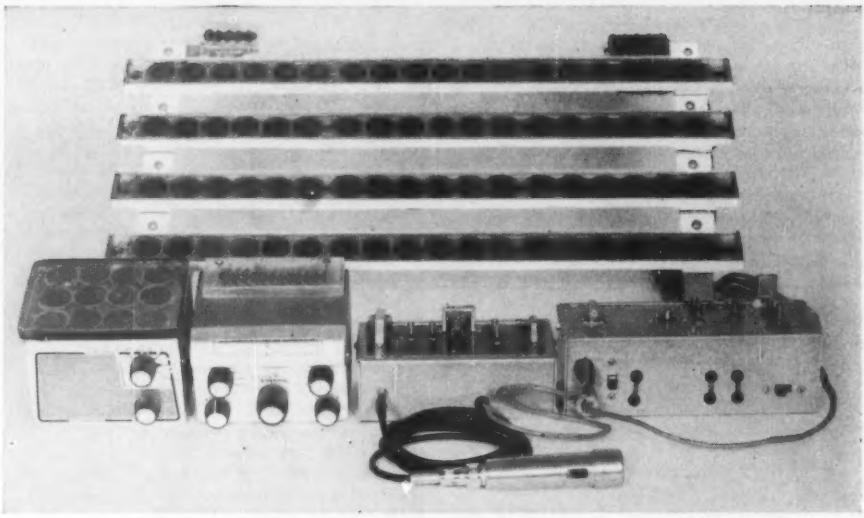

The sun-powered station uses completely transistorized equipment. The receiver, at left, has a Regency converter with a Regency broadcast receiver as an i.f. amplifier. Transmitter has two home-built units, the modulator (center) and r.f. section (right). Solar cell batteries for the receiver are mounted on the tops of the two units. The rack at the rear has the solar cells for the transmitter. Ordinary dry batteries can be used instead, of course.

Ten-Meter Transistorized Phone Transmitter

New Terrestrial DX Records on Solar Power

BY MAJOR GILBERT,* K6LMW

The transmitter described in this article is part of a completely transistorized solar-powered amateur station. Two 2000-mile contacts, to Illinois, were made with the transmitter on September 13, 1958, on the 10-meter phone band, with signal reports of RS 57 and 59. On Sunday, September 21, stations in Texas, Missouri, and Minnesota were contacted with reports of 59, 55 and 59, respectively. These contacts were not pre-arranged and others have been made since. The operating frequencies are 28.82 Mc., 28.96 Mc., and 29.06 Mc.

EVER started out on Field Day and complained about the amount of equipment you had to haul to that mountain top? Here is a little rig that you can almost hold in the palm of your hand. It will operate from solar cells during the day and rechargeable or dry cells at night. It will give you plenty of good contacts. The frequency can be changed to your favorite band by using coils appropriate for the frequency. Power output will increase on the lower bands because the efficiency increases.

(Future plans call for a new transmitter, utilizing band switching, to be built covering 10 meters through 80 meters.)

The complete solar-powered amateur station is shown in one of the photographs. The receiver is a Regency TR-1A and the converter is a Regency ATC-1. Both units have been converted to solar power and they cover all amateur bands from 80 through 10 meters.

The Transmitter

The transmitter uses RCA 2N384 v.h.f. drift transistors throughout.

In the photograph of the r.f. chassis of the transmitter, the crystal oscillator section is at the

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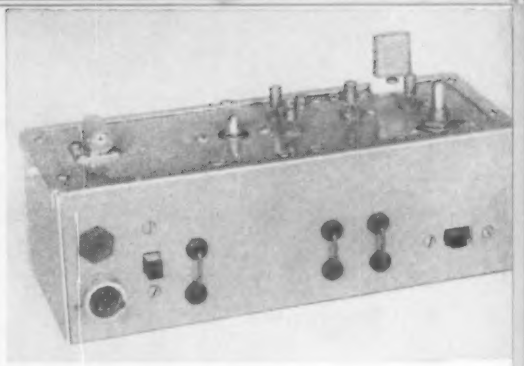


The r.f. section of the transmitter. Oscillator-buffer-final run from right to left in this view, as described in the text.

right end with the forward-bias control protruding through the top of the chassis. The transistor to the left of the oscillator is the buffer-doubler, and the two side by side are the push-pull power amplifier.

The tuning controls for the oscillator and the buffer-doubler are located alongside the crystal at the rear of the chassis. The tuning control for the final can be seen protruding through the top of the chassis to the left of the final-amplifier transistors. The r.f. output BNC connector is at the extreme left on top of the chassis. The power-input plug is on the front panel at bottom left. The plug above it supplies collector voltage to the modulator unit and also delivers the d.c. to the modulation transformer and returns the modulated d.c. to the collectors of the push-pull final.

The switch next to the power plugs controls the voltage to all collectors of both the transmitter and modulator. The three pairs of jacks with the jumpers inserted are for monitoring collector current of the three stages and are, left to right, for the final, buffer-doubler and oscillator stages. The switch at the right side controls the forward-bias voltage for the oscillator.

In the below-chassis view of the r.f. section the oscillator is at the extreme right end, the buffer-doubler is in left center, and the push-pull final is at the left end.

Construction Details

The transmitter is built on a $2\frac{1}{2} \times 3 \times 8$-inch LMB chassis box. The component placement was not found to be critical, nor was neutralization of the final found to be necessary.

The oscillator uses the Butler circuit, which is a very good transistor oscillator circuit at high frequencies. Although the oscillator is quite stable, the tap on L_1 may have to be moved for crystals of different activity. Too much feedback will cause the crystal to lose control. The crystals used were 43-Mc. 3rd-overtone surplus units operated on their fundamental frequencies. If the crystal is replaced by a capacitor the oscillator will operate self-controlled on the frequency to which it is tuned.

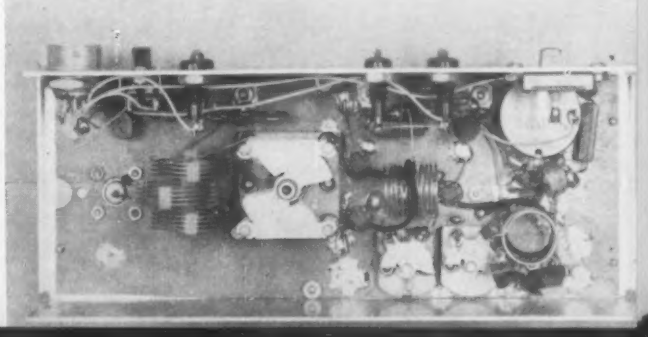
The axis of the coils for the oscillator, buffer-doubler and final are at right angles to each other to prevent inductive coupling between stages. Inductive coupling is used between all stages and the final has an adjustable swinging link. The buffer-doubler and final stages use the grounded-emitter arrangement and bias stabilization was not necessary since none of the stages showed any tendency toward thermal runaway. The forward-bias potentiometer is 50,000 ohms.

Modulator

The modulator circuit, also given in Fig. 1, is a straightforward audio amplifier utilizing standard Triad transformers, available from most parts houses. T_1 is a Triad TY-59X with the windings reversed; that is, the winding that is normally the secondary is connected to the microphone (crystal or dynamic) to obtain a high input impedance, and the winding that is ordinarily the primary is connected to the modulator gain control. T_2, a Triad TY-52X, is connected conventionally. The modulation transformer, T_3, is a Triad T-41X turned around; the low-impedance winding is connected to the push-pull collectors of the output stage and the high-impedance winding is connected between the r.f. final coil center tap and the d.c. supply for the final r.f. stage collectors.

The modulator is constructed on a $2 \times 3 \times 6$-inch LMB chassis box. In the front view, the input transformer is at the left and the gain control is just in front of it. The driver transformer is in the center and the modulation transformer is at the extreme right. The microphone jack, a subminiature type, is mounted near the left edge of the front panel.

In the bottom view of the modulator unit the speech amplifier is at the left, the driver is in the center, and the push-pull output stage is at the right. The jack on the rear panel (lower edge, in this view) is the modulation test jack. High-impedance (4000 ohms) headphones may be plugged into this jack and 12 volts applied to the



Except for size, the three-stage transistor transmitter looks much like a corresponding low-power tube job underneath the chassis. Oscillator section is at the right in this picture.

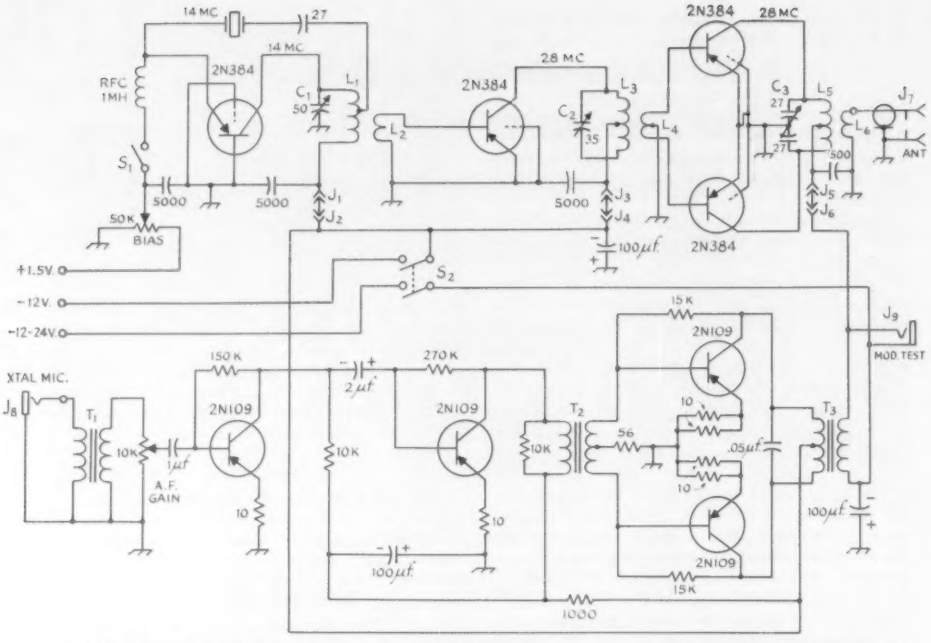
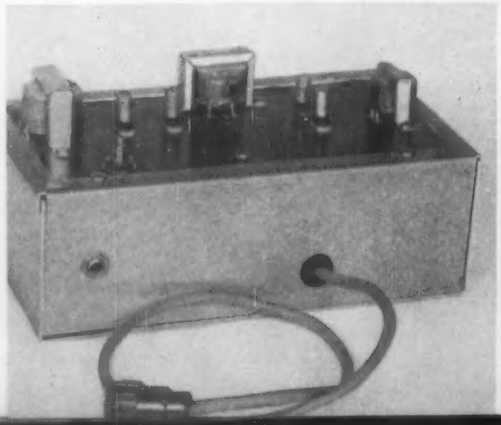


Fig. 1—Circuit diagram of the complete 10-meter transistor transmitter. Unless otherwise indicated, capacitances are in μμf., resistances are in ohms, resistors are ½ watt. Fixed capacitors should be 25-volt or larger d.c.w.v. rating; units with polarities marked are electrolytic.

C_1—50-μμf. air trimmer.
C_2—35-μμf. air trimmer.
C_3—27 μμf. per section butterfly (Hammarlund BFC-25).
J_1-J_6, inc.—Pin jacks.
J_7—Coaxial chassis connector, type BNC.
J_8—Open-circuit jack, miniature type.
J_9—Open-circuit jack.
L_1—9 turns No. 18, ¾-inch diam., ⅝ inch long, tapped 4½ turns from cold end. Adjust to resonate at 14 Mc., adding fixed capacitance across C_1 if necessary. Experiment with tap position if crystal does not lock in.
L_2—1 turn No. 20, ¾-inch diam.; insert between 4th and 5th turns of L_1.
L_3—10 turns No. 20, c.t., ¾-inch diam., ¾ inch long. Resonate to 28 Mc.
L_4—1 turn No. 20, ¾-inch diam., center-tapped. Insert in center of L_3.
L_5—Two sections 4 turns each, 1-inch diam., 16 t.p.i., ⅜ inch between sections (Air Dux 816).
L_6—4 turns same as L_5.
S_1—S.p.s.t. slide switch.
S_2—D.p.s.t. slide switch.
T_1—50,000 to 5000 ohm audio; see text (Triad TY-59X).
T_2—20,000 to 2000 ohm audio driver (Triad TY-52X).
T_3—200 to 1000 ohm audio driver; see text (Triad T-41X).

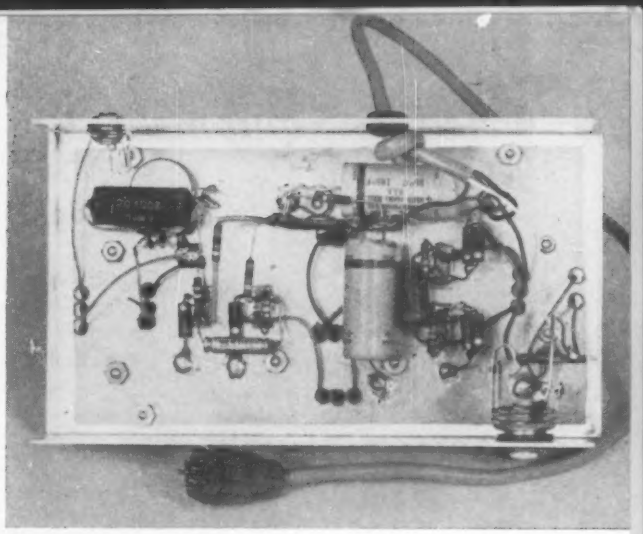
The modulator layout is straightforward. Plug and cable in the foreground goes to the r.f. unit for interconnections. This connection system is not shown in the composite circuit given in Fig. 1, and may be modified to suit the builder's taste.



modulator to check modulation. With a 4000- to 3.2-ohm transformer plugged into this jack and a speaker connected to the 3.2-ohm winding, the modulator makes an excellent audio amplifier capable of delivering approximately 200 milliwatts of audio.

Tuning Procedure

To tune up the transmitter, first remove all of the jumper bars from jacks J_1-J_2, J_3-J_4, and J_5-J_6. Connect a 0–10-milliammeter between J_1 and J_2. Before putting the transistor in the oscillator socket check the forward-bias control and make sure it increases the forward bias in a clockwise direction. Set the control in the extreme counterclockwise position. Plug in all the transistors and apply collector voltage. The meter in J_1-J_2 should read very little, but may have a slight upward movement. Advance the forward-



Simplicity is the keynote in the modulator wiring. Jack at bottom is to permit using the unit as an audio amplifier for other purposes than modulating the transmitter.

bias control in the clockwise direction and the meter will start to read up scale, and when the reading jumps up sharply the oscillator is functioning properly.

Next, return the forward-bias control to the counterclockwise position and plug a 0–10 milliammeter in J_3-J_4, and 0–20 milliammeter in J_5-J_6. Place a 52-ohm ½-watt resistor across the output r.f. connector, J_7, or use a low-power r.f. wattmeter or r.f. indicator if either is available. Advance the forward-bias control, while watching the meters, until the buffer-doubler current is approximately 6 ma. Tune the oscillator tuning condenser for maximum buffer current. (*Caution:* Do not exceed 10 ma. as it will damage the transistor.) If the buffer current exceeds 8 ma., reduce the forward bias to the oscillator and continue tuning the oscillator to resonance. When the buffer current is peaked adjust the forward-bias control so that the buffer current is approximately 6 ma. Now, adjust the buffer tuning control for maximum drive to the final. Do not exceed 20 ma. final collector current. The forward bias on the oscillator may have to be further reduced to keep the final collector current under 20 ma.; however, it was not found to be necessary in this transmitter.

Typical currents are listed below:

Oscillator	1–2 ma.
Buffer	6–8 ma.
Final	4–6 ma.

Modulator Total Drain

Idle	4 ma.
Average Current	15 ma.
Voice Peaks	40 ma.

Tune the final for maximum output, then adjust the swinging link for maximum output as indicated by the r.f. indicator and you are ready to go on the air. Recheck tuning of all stages and adjust the forward bias so that all collector currents are approximately as shown in the table. If an r.f. indicator is not available, connect a piece of wire to the antenna terminal of your receiver, tune to your operating frequency and adjust the final tuning and link for maximum S-meter reading. Do not try to tune the oscillator and buffer this way.

Power output is approximately as follows:

12 volts on all stages — 30 milliwatts
12 volts on oscillator and buffer, 24 volts on final — 60 milliwatts
12 volts on oscillator and buffer, 28 volts on final — 75 milliwatts

Power Supply

The solar-cell power supply for the transmitter is composed of 72 Hoffman Type 2A silicon solar cells, manufactured by the Semiconductor Division, Hoffman Electronic Corporation, Evanston, Illinois. The forward-bias cell is five Hoffman 120C solar cells.

Strays

W2TOX, 15 years old, wonders if he is the youngest ham on radioteletype.

—···—

More gear stolen. A Morrow MB560 transmitter and a Morrow MBR5 converter were stolen from K6BZX during September. (No serial numbers given.)

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W1BTI ("Neat and Clean," page 69, October *QST*) says that a number of fellows have asked him about the conelrad system he is using. It was adapted from Hints and Kinks in the January, 1957, issue of *QST*, page 49.

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More aids for those who wish to build up neat operating positions but who aren't very handy with hammer and saw. Bulletin 4458 by Bud Radio describes a new line of console assemblies.

• Recent Equipment —

Globe Sidebander DSB-100

ALTHOUGH the name would indicate that the DSB-100 is strictly a phone transmitter, such is not the case. The DSB-100 is a combination job that runs 50 watts input on c.w., 40 watts on a.m. and 100 watts p.e.p. input on d.s.b. (double sideband, no carrier). If you're wondering why d.s.b. and not s.s.b. (single sideband), read on. A d.s.b. signal is very easy to produce, and this means that a d.s.b. transmitter will be much less expensive than one that generates but one sideband. A d.s.b. signal has little or no carrier, so it creates no heterodyne interference on the band. Furthermore, the available power goes into sidebands, where it does some good at the receiving end, instead of into a carrier that does little more than set an S meter. A d.s.b. signal can walk into a group of single sidebanders and join them just as though it was an s.s.b. signal, since most of the receivers these days have enough selectivity to make an s.s.b. signal out of a d.s.b. one.

Perhaps this last point needs some elaboration. An s.s.b. signal is received with the receiver b.f.o. on, to furnish the "local carrier" for demodulation of the signal. If the signal is mistuned with respect to this local carrier, the signal becomes high-pitched or low-pitched, and unintelligible if the mistuning is too great. However, there is a mistuning region of 50 to 100 cycles or so in which the intelligibility is adequate (even if the fidelity is not) for communication. This is not true of a d.s.b. signal. With a d.s.b. signal there is little or no room for a tuning error; the carrier must be reinserted in the proper frequency and, worse yet, proper phase. These requirements are impossible to meet with the normal a.m. or s.s.b. receiver, and by now you must be wondering how in blue blazes Globe expects to peddle any d.s.b. rigs if no one can copy the signals!

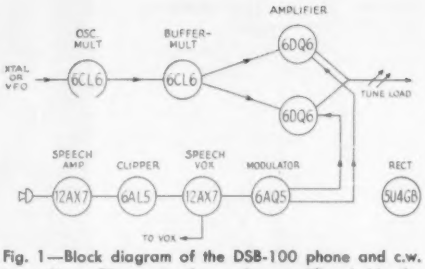
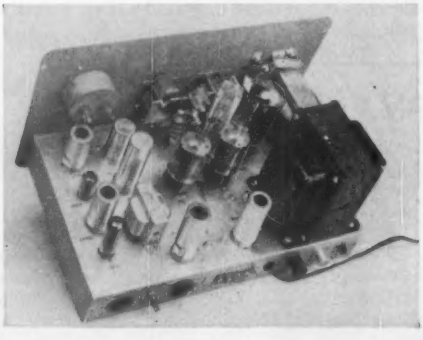


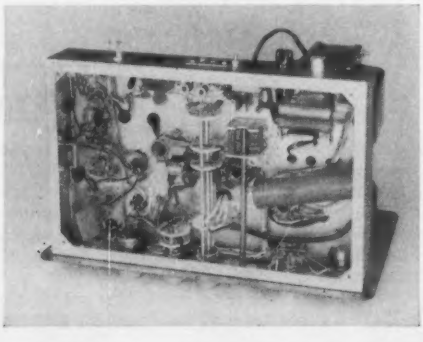
Fig. 1—Block diagram of the DSB-100 phone and c.w. transmitter. Clipper in the audio amplifier holds the modulation at a high level without exceeding the limits of linearity in the output stage.

The answer is very simple. Most receivers have enough selectivity to lop off one sideband of a double-sideband signal, so all that is necessary to copy a d.s.b. signal is to tune it in like s.s.b. on a selective receiver. The signal is made s.s.b. before it reaches the detector. If there is one disadvantage to d.s.b. it is that you may occasionally run into a fellow who doesn't have enough receiver selectivity to copy you well. In that case you can swing over to a.m. But the majority of the time you will be working the s.s.b. gang, and enjoying the advantages of s.s.b., including voice-controlled break-in. Yes, d.s.b. when used intelligently can be very effective. If you have any doubts, ask the old timers in the s.s.b. gang about Wayne Cooper, YN1WC (and several other calls). He worked d.s.b. for some time before more than a few of the s.s.b. boys realized he had a pair of sidebands.

The Sidebander DSB-100 was apparently de-

The DSB-100 is a compact (8 by 8 by 14 inches) self-contained transmitter. Crystal-controlled operation requires that a crystal be plugged in the right-hand octal socket on the rear apron; for v.f.o. operation the v.f.o. signal is introduced at the same socket. The dull coating on the meter (upper left) is a copper flash used to shield the meter.





signed to get the most effective d.s.b. rig possible consistent with operating convenience and low cost. Referring to the block diagram, Fig. 1, it starts out with a 6CL6 crystal-oscillator stage that operates on 80 or 40 meters, depending upon the band in use. This crystal-oscillator stage is used as a buffer or multiplier if an external v.f.o. is used. A second 6CL6 is used as buffer or multiplier, again depending upon the band in use, but its output circuit is such that push-pull excitation is available for the output stage. But the plates of the output tubes are connected in parallel to a pi network, and you probably wonder "What's all this jazz about push-pull drive and parallel output?" Simple. One form of "balanced-modulator" circuit uses push-pull drive, parallel output and push-pull audio, and that is exactly what this pair of 6DQ6s does. A balanced modulator is a device that generates sidebands with little or no carrier, and that's what we have here. For c.w. or a.m. operation, the d.c. cathode circuit of one 6DQ6 is opened, leaving the remaining tube to act as an amplifier neutralized by the inactive tube. Panel controls are available for grid and plate tuning and loading of the final; the coupling between 6CL6s is fixed-tuned, peaked for the required frequency band. A milliammeter can be switched to read final grid or cathode current.

In the audio department, both triodes of a 12AX7 serve as the speech amplifier to build up the microphone signals. The input triode can be switched to serve as an audio oscillator for tune-up and test; a nice touch there is the use of a printed-circuit assembly for the feed-back network. Using these constants, the frequency runs around 700 cycles. The circuit is given in Fig. 2, for anyone who might want to add this feature to his present transmitter.

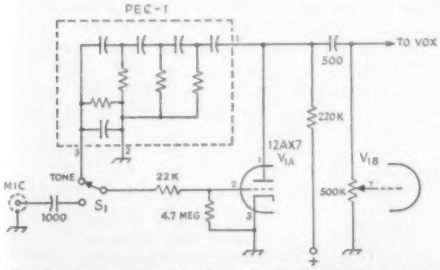
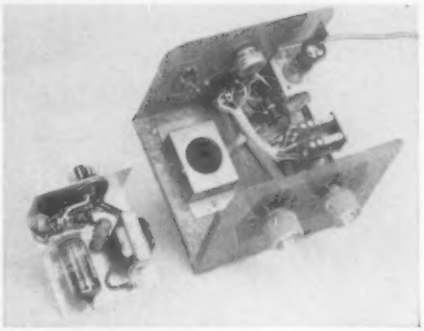


Fig. 2—Test-oscillator circuit used in the DSB-100. Capacitances are in $\mu\mu$f. PEC-1, surrounded by dashed lines, is a Centralab printed electronic circuit, designated 1109–003 in the DSB-100 instruction book. (We were unable to find the values of its components.) One could be bought from Globe as a replacement part.



The VOX-10 (right) and the plug-in QT-10.

Following the 12AX7 there is a 6AL5 diode clipper that holds down the signal to a level determined by the fixed bias on the diode. Since clipping generates harmonics, the clipper is followed by a low-pass filter that minimizes these high-frequency components. The clipped signal is amplified again and the 6AQ5 modulates the screens of the 6DQ6s. There is no need to worry about bias and audio levels and other adjustments when switching from a.m. to d.s.b. and back; once the initial adjustments have been made the mode switching takes care of everything.

The VOX mentioned earlier and indicated in Fig. 1 is not built into the DSB-100. VOX operation is obtained through the use of the Globe VOX-10, a self-contained unit measuring 4½ by 6 by 5 inches that makes up to the DSB-100 through a cable and a socket on the rear apron of the DSB-100. The VOX-10 has a 12AX7 in it, one triode serving as a diode rectifier and the other as a relay control tube. The hold-in time is adjustable at the rear of the unit, while the VOX sensitivity is a panel control. A plug-in unit, the QT-10, provides VOX operation with a loud-speaker. The QT-10 also uses a 12AX7, one triode as amplifier and the other as diode rectifier. Rectified audio output from the receiver biases the rectifier in the VOX circuit so that loud-speaker signals cannot operate the VOX via the microphone.

The DSB-100 and VOX-10 are available wired or in kit form. — *B. G.*

The Heath Mohawk Receiver Kit

TRANSMITTERS for all modes and power levels in kit form have been with us for some time, but until recently no serious ventures had been attempted into the more difficult field of communications receivers. The Mohawk represents one of the first efforts to compete with some of the better-grade factory-built receivers. It is no short-wave receiver with bandspread thrown in as an afterthought. Both mechanically and electrically, its design follows principles that set a "communications-type" receiver apart from the "all-wave" tuner.

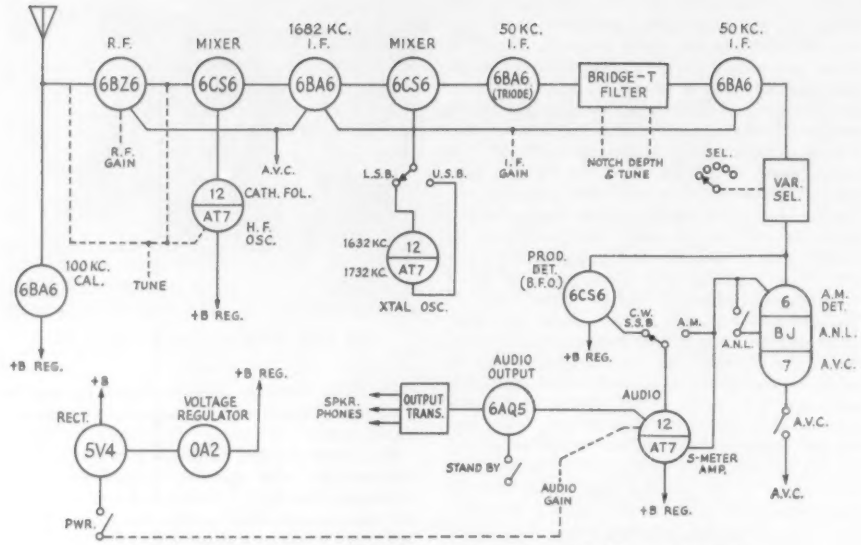


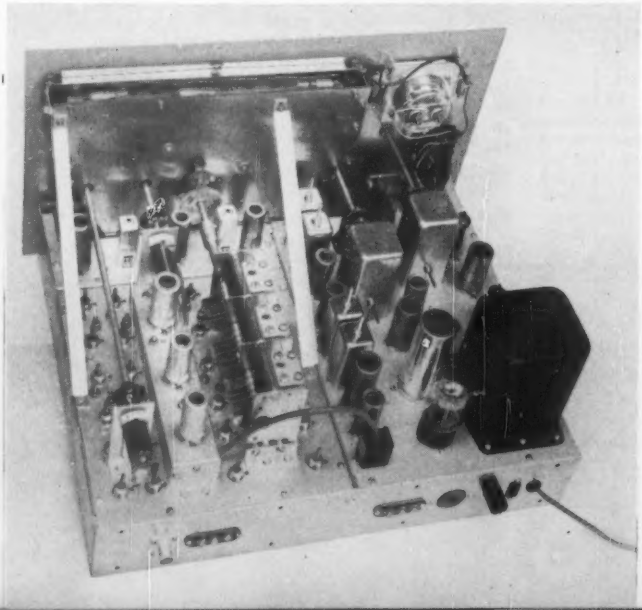
Fig. 1—Block diagram of the Heath Mohawk receiver showing tube line-up and controls.

Essentially it is a ham-bands-only dual-conversion superhet with a tunable front end, covering all bands, 160 through 10 meters. There is also a dial calibration for 6 and 2 meters to be used when feeding converters into the receiver. There are 15 tubes, including the power rectifier and a VR tube. Four of these are multipurpose.

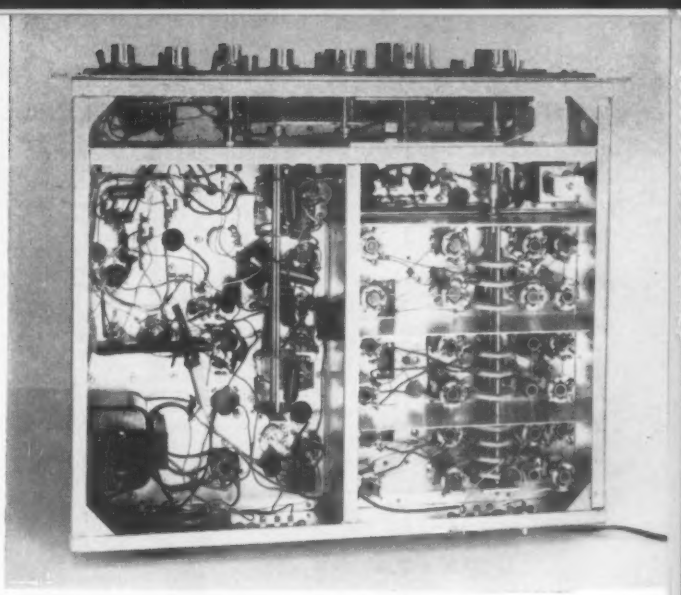
Circuit

A block diagram of the receiver tube line-up is shown in Fig. 1. In brief, a single r.f. stage feeds a mixer converting signal frequency to 1682 kc. A single amplifier stage at 1682 kc. feeds a second mixer converting to 50 kc. Two stages at 50 kc. then feed either a diode detector for a.m. or a product detector for c.w. and s.s.b. The line-up ends with an audio amplifier and a power-output stage. Auxiliaries are a sideband selector, automatic series noise limiter, a.v.c. rectifier, S-meter amplifier, bridged-T filter, i.f. selectivity control and a 100-kc. crystal calibrator.

The r.f. stage uses a 6BZ6. This stage has a separate gain control that will help to contain the ham in the next block as well as that commercial outside the low end of 20. The input coupling coils are tapped for either balanced (150–300 ohms) or unbalanced (50–72 ohms) input. A standard coax connector at the rear makes the latter connection convenient. An antenna trimmer has a control on the front panel.



The Mohawk is made up of three subassemblies which mount on an open chassis frame. The section in the foreground at the left is the preassembled and wired front end. Extension shafts operate the antenna-trimmer and dial-calibration capacitors. The strip close to the panel at the left contains the 1682-kc. first i.f. circuits. Low-frequency i.f., audio and power circuits are in the large section to the right. Double panel construction and panel bracing assure good mechanical stability.



The r.f. oscillator and mixer sections of the preassembled front end are separated by shielding partitions. The band switch and all coil forms are ceramic. Near the upper right-hand corner, a clamp holds the twin crystals of the selectable sideband system in their sockets. The gang switch in the left-hand compartment controls the i.f. selectivity. All control knobs on the panel are of cast aluminum.

"Pulling" effects are minimized by coupling the high-frequency oscillator to the No. 3 grid (used here as the injection grid) of the 6CS6 first mixer through a cathode follower. A 12AT7 dual triode performs the functions of oscillator and follower. The first mixer feeds a single amplifier (6BA6) at 1682 kc.

The two triode units of another 12AT7 in twin crystal-controlled oscillators, one 50 kc. above and the other 50 kc. below the 1682-kc. i.f., feed the 6CS6 second mixer. A switch selects one or the other of the oscillators depending on whether the upper or lower sideband is wanted.

In the two-stage 50-kc. i.f. amplifier which follows the second mixer, double-tuned circuits, with the tubes tapped down on both input and output coils to maintain high Q, are used between the mixer and the first i.f. stage (6BA6, triode-connected), and between the second i.f. stage (6BA6) and the detector. These circuits are coupled capacitively, and loaded with resistance when a wider pass band is wanted. Five degrees of selectivity, from 5 kc. to 0.5 kc., are provided by a switch that varies the coupling and the loading simultaneously. Coupling between the two i.f. stages is simple capacitive except when a switch is thrown to insert the bridged-T filter for attenuating an interfering heterodyne. The position of the notch in the pass band and its depth (up to 50 or 60 db.) are independently adjustable. Only the 1682-kc. amplifier and the second 50-kc. amplifier are on the manual i.f. gain control.

One of the three diode sections of a 6BJ7 is used as the a.m. detector. Of the two remaining diodes, one is the a.v.c. rectifier and the other a series noise limiter. A.v.c. (delayed) is applied only to the r.f. stage and the 1682-kc. amplifier. The a.m.-s.s.b./c.w. switch substitutes a 6CS6 product detector for the diode.

One triode section of a 12AT7 is used in the first audio amplifier where audio gain is controlled. The other section is an S-meter amplifier. This amplifier takes a signal from the a.m. detector through an RC network. The S meter is in the cathode circuit. The meter is calibrated for an S9 reading with a 100-μv. signal on 10 meters. Headphone output, of which there is plenty for either high- or low-impedance headsets, is taken from a 500-ohm tap on the output-transformer secondary. The speaker (not included) is automatically shorted out when the headphones are plugged in. The stand-by switch kills the audio output by inserting a high resistance in the cathode of the output tube. The remaining tubes in the receiver remain in normal operating condition to minimize temperature variations.

The receiver includes a 100-kc. crystal calibrator operated by a push button on the panel. A trimmer in the h.f. oscillator circuit can be adjusted from the panel to bring the dial calibration into alignment.

Plate voltage for the first h.f. oscillator and cathode follower, the product detector (b.f.o.) and the S-meter amplifier is regulated at 150 volts by an 0A2. With the use of converters for the 6- and 2-meter bands in mind, plate voltage, filament voltage, a.v.c. voltage and a remote connection for the stand-by switch are available at an accessory socket at the rear of the receiver.

Assembly

The producers of the Mohawk kit have taken most of the headaches (for themselves as well as the customer, we imagine) out of the assembly and alignment by furnishing the front end (band-switching r.f., h.f. oscillator and mixer stages) completely assembled, wired and aligned as a unit that mounts in the main chassis with a few screws. The only wiring necessary is to make the connections to the antenna terminals. Power-supply and signal-output connections are made by means of cables and plugs already assembled. Also, most of the power and control wiring is in

Continued on page 186)

Technical Correspondence

THE SLOT ANTENNA

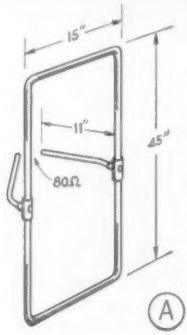
147-17 Charter Road
Jamaica 35, New York

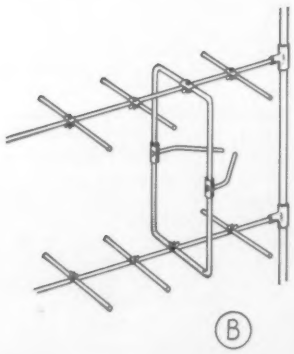
Technical Editor, *QST*:

While in England this summer, I had the opportunity to talk over 2-meter activities with Mr. John A. Rouse, G2AHL, of the Radio Society of Great Britain. He told me about an antenna type which has become very popular — almost standard — for 2-meter work, called the "skeleton slot" or simply the "slot antenna."

The antenna is derived from the aircraft slot antenna, in which a resonant slot in a metal panel (the skin of an aircraft, for example) is driven. The slot is the antenna, *not* the metal panel. Mr. B. Sykes, G2HCG, who did much of the original work on skeleton slots, was interested in discovering just how much of the paneling might be cut away and still retain the characteristics of the slot antenna. He finally wound up with a thin (½-inch or so) metal rod enclosing the slot.

In diagram A (which gives the dimensions generally used on 2 meters) the slot antenna looks at first glance to be something like a quad, but it behaves quite differently.





The slot antenna has been described as two horizontally-polarized (bent) dipoles — the shaded part of the diagram — with high-impedance open-wire "feeders" joining the ends together. For optimum performance it seems that the impedance of these "feeders" should be 500–600 ohms. The point at which the dipoles end and the feeders begin is thus not clearly defined, and it is believed that this results in the broadband properties of the antenna as compared with a resonant dipole.

Feed is accomplished by means of a delta match connected equidistant from the two dipoles along the open-wire "feeders." This transforms the impedance down to 80 ohms or other line impedance as required.

The slot antenna, considering that it might be looked at as a collinear arrangement, does not show impressive gain over a dipole. However, gain is not the case in point. A most attractive feature of the slot antenna is that the match to the feeders seems to be constant over a wide range of conditions. One possible explanation is that the dipoles are "self-adjusting" for the reason already given; as the frequency or other condition changes, the length of metal which behaves like a radiator changes also.

This simplifies the use of the slot antenna as the radiating element in a number of practical arrays. It is frequently used as the driven element in stacked Yagi beams such as the "5 over 5" shown in "B." In this case, the impedance of the antenna (with the delta match) remains at 80 ohms; the drop in impedance we would expect as elements are added does not occur. A recent article in the *RSGB Bulletin* described two slots, one-eighth wavelength apart, driven 45 degrees out of phase, to give increased gain and some front-to-back ratio advantage. Another article showed how to make a turnstile slot to get horizontally-polarized omnidirectional radiation.

British amateurs seem to have taken to the slot antenna because of this factor and because of its physical ruggedness and ease of construction. The centers of the dipoles are theoretically at ground potential, making the antenna easy to mount.

Commercially-manufactured arrays using the slot are available in Great Britain for the 2-meter and 70-cm. bands, using up to 15 elements, with claimed gains up to 15 db. It might be interesting to do some experimenting with the slot antenna, especially at the frequencies above 144 Mc.

— *Julian N. Jablin, W2QPQ*

AMATEUR SATELLITE RECEPTION AND RECORDING

Geophysics Research Directorate
Air Force Cambridge Research Center
Air Research and Development Command
Laurence G. Hanscom Field
Bedford, Massachusetts

Technical Editor, *QST*:

The response of amateurs and others to the request for measurements of the U. S. satellite signals has been gratifying and, as was expected, has provided valuable information. I would like to review very briefly the two major fields of measurements that may be undertaken by independent investigators such as amateurs and s.w.l.'s.

The first field is that of doppler measurement which requires the use of receiving equipment of a high degree of frequency stability. It must not be subject to either local or beat oscillator drift nor a.g.c. frequency-pulling effects. These measurements, then, require the use of a crystal controlled heterodyne oscillator at the carrier frequency, or a subharmonic thereof, or a receiver whose internal construction provides a comparable stability. These measurements can and are being made by various amateurs and the data obtained will be of value in many cases.

The second major contribution is the direct recording of telemetry signals from the satellite transmitters. We have had occasion to request the loan of quite a few amateur tape recordings of satellite telemetry signals which were recorded at what was considered to be critical periods. It has been noted that in all cases they suffer from one particular defect — the use of a heterodyne oscillator either at the carrier or intermediate frequency. It is likely in most cases the heterodyne oscillator was used for doppler measurement purposes.

Simultaneous doppler measurements and telemetry reception by the same receiver tend to be incompatible. Assuming an amplitude modulated transmission, two reasons may be advanced to support this statement:

1. A beat oscillator produces its strongest output signal by heterodyning against the carrier frequency itself. The fact that this frequency varies because of receiver instability and/or doppler shift makes it exceedingly difficult to remove with a filter. If the heterodyne falls within a desired telemetry channel and close to the telemetered frequency, the data becomes almost impossible to read. This is generally true at least part of the time.

2. The beat oscillator also heterodynes against the side-

(*Continued on page 180*)

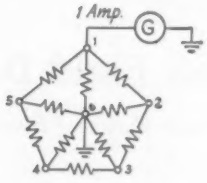
Quist Quiz

Feeling that the v.h.f. men have been neglected by this department, Sam Goldish, W5TVG of Tulsa, sends us the following puzzler:

A 6-meter man has a ¼-wave vertical antenna made of solid aluminum rod ¾ inches in diameter and 1.7 yards long. He wishes to take it with him on a train, but the conductor won't allow it in the coach and the baggage man won't accept any article whose greatest dimension exceeds 1 yard. The resourceful v.h.f. man figured out a way to take his antenna on the train. Can you?

—·—

The key to last month's problem was the symmetry of the circuits. If the circuit is drawn for the generator delivering 1 ampere, it looks like this:



Obviously the voltages at points 3 and 4 are the same, and there is no current flow through R_{34} from the generator delivering 1 ampere. Similarly, from the other generator there is no current through R_{15}.

Finding resultant values of resistors and using the laws of Kirchoff, the currents from the generator delivering 1 ampere are

$i_{15} = i_{12} = 3/11$ amp. $\quad i_{16} = 5/11$ amp.
$i_{26} = i_{56} = 2/11$ amp. $\quad i_{23} = i_{36} = i_{54} = i_{46} = 1/11$

The currents from the generator delivering 2 amperes are

$i_{32} = i_{34} = 6/11$ amp. $\quad i_{35} = 10/11$ amp.
$i_{26} = i_{46} = 4/11$ amp. $\quad i_{21} = i_{16} = i_{45} = i_{56} = 2/11$

Summing the results,

$I_{13} = (i_{12})_1 + (i_{12})_2 = (i_{12})_1 - (i_{21})_2 = 3/11 - 2/11 = 1/11$ amp.

Similarly,

$I_{15} = 3/11$	$I_{16} = 7/11$	$I_{26} = 6/11$
$I_{32} = 5/11$	$I_{34} = 6/11$	$I_{35} = 1$
$I_{45} = 1/11$	$I_{46} = 5/11$	$I_{56} = 4/11$

FEEDBACK

In the circuit diagram of "Pygmy Powerhouse II" on page 12 of the October issue, the length of the v.f.o. coil, L_1, should be 1⅝ inches instead of ⅝ inch.

Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

W2ASG, Luther Mkitarian, Haddonfield, N. J.
W2JYG, Charles F. Polsten, Sayville, N. Y.
K2ZYT, Ralph W. Scott, Westmont, N. J.
W3DGB, William E. Heiser, Shamokin, Pa.
W3IQN, John B. Thomas, York, Pa.
W5VHW, John V. Harwood, jr., Andrews, Texas
W6QYQ, Raymond J. Heringer, Clarksburg, Calif.
W7RPL, Orvil J. Hansen, Richfield, Utah
K8BDW, Harold J. Kell, Lansing, Mich.
W9IQC, W. Gordon Currie, LaSalle, Ill.
WØCJS, Marion J. Junkins, Watertown, S. Dak.
KØEYI, Leslie B. Vennard, Burlington, Iowa
WØZT, Burton S. Waldron, Minneapolis, Minn.

25 Years Ago this month

December 1933

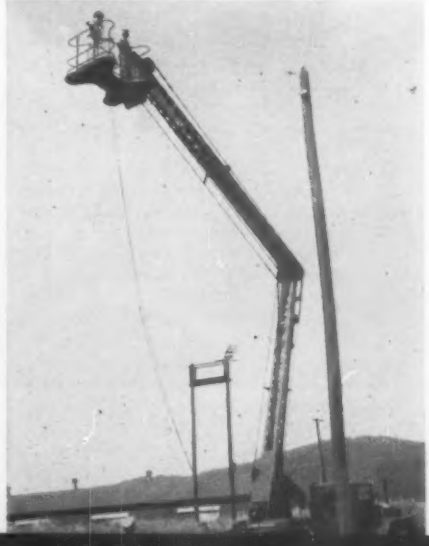
. . . For the technical man there was info on preselection and image rejection in shortwave superhets, a phone and c.w. transmitter using the new type 800 tubes, dope on the sins of overmodulation, an amplifier using an RK-18 tube, and a couple of pages of hints and kinks for the experimenter.

. . . For the man interested in operating matters, there were reminiscences of the ten-years ago (now 35 years ago) exploits of working across the Atlantic for the first time, dope on 56-Mc. tests from an MIT airplane and on a simple break-in system for the phone operator, and Byrd Expedition news.

. . . Also, this issue carried announcement of the Fourth All-Section Sweepstakes contest, which was to run for nine days during the middle of December.

Strays

K2GC/4 tells us that this is how they service antennas at K4WMA. This thing is known as a cherry picker, and will go as high as 60'. Its auxiliary function is to service Corporal missiles.



Because only a contest-type iron man can perform capably for a 24-hour stretch, teams usually are scheduled to go on and off duty at regular intervals. These two Nineland groups believe operator efficiency is increased when shut-eye time is provided. At left, K9AXO pounds bug and KN9MXW logs while K9IZI snoozes at K9WBT/9. But all good things must come to an end, and in the *Chicago Tribune* pic on the right, K9CYS rouses K9JAU to take early morning trick on transmitter for Chiburban Radio Mobileers' K9ATM/9.

Record 11,316 Hams on 1958 Field Day!

Sideband and V.H.F. Activity Zooms but Many Scores Plummet as Aurora Rips Bands

BY PHIL SIMMONS,* W1ZDP

CONDITIONS were the worst experienced during any Field Day since 1946. Things started off with one-way skip. Incoming signals were S9 but no replies were received regardless of antennas tried. The evening produced one of the most breath-taking aurora displays ever witnessed. This resulted, however, in a nearly 100 per cent black-out on all bands below 28 Mc. For almost four hours, neither of our two stations made a single QSO. While it is tempting to sleep at such times, the chance was not taken for fear of a sudden band opening." — *VE2CB/2.* . . . "Pretty northern lights and pretty dead bands. Contacts were so far apart we never needed loggers to help our operators." — *K9GUY/9.* . . . "We could hear other parts of the country work each other during the fade-out but we were dead often as long as two hours. Tough on the score!" — *W0DK1/0* . . . . "The best location, equipment and antennas available for the grand attempt to beat the top W8 contact total came to naught when aurora folded the bands early Saturday. 16 QSOs with a full wave on 80. Horrible!" — *W8DJN/8.* . . . "Highest noise level in six years of FD." — *VE3SCD/3.* . . . "Let's try to arrange a week end free from aurora disturbances." — *K9DVF/9.* . . . "Never saw such rotten conditions. Almost a complete black-out. Very discouraging." — *VE2CO/2.* . . . "At East Aurora, N. Y., we were in the right spot for the flutter. Reception was absolutely impossible at times." — *W2PET/2.* . . . "The bright aurora June 28 completely wiped out all bands below 14 Mc." — *W7SSF/7.* . . . "When the northern lights took over, we watched 'Gunsmoke' on a portable TV." — *W3CYU/3.* . . . "Although we had an ideal QTH with antennas pointed at U. S. A., we don't remember having seen the bands poorer. Guess all VE2s were in the same boat." — *VE2JB/2.* . . . "Never have conditions been so awful. Saturday night produced some beautiful aurora but we had no 50-Mc. gear. The flutter was evident all evening on 20 and 40, and 15 and 10 were useless." — *W0IO/0.* . . . "Our hilltop location gave the night shift a beautiful view of the northern lights but for some reason the display was not appreciated." — *W9AML/9.* . . . "How could you have chosen such a date for this wonderful event? Or should I say, 'Who stole 80 meters?' Imagine making 15 contacts on a band that last year netted ten times that amount." — *VE3FT/3.* . . . "WWV said the bands would be useless to very poor, a prediction which turned out to be correct. All in all it was a poor FD for Alaska." — *KL7COJ/KL7.* . . . "The brilliant display, visible in the sky for hours, gummed up signals so they sounded as if they were originating from the

* Asst. Communications Manager, C.W., ARRL.

depths of Tibet. The watery, hollow, fluttery characteristic kept up for hours, with contact averages dropping far below the normal anticipated." — *W9PCS/9*. . . . "The aurora brought about our lowest score yet, and v.h.f. beat out the l.f. bands for the first time." — *VE3JJ/3*. . . . "Please make aurora borealis illegal during the FD period." — *W7ROY/7*.

Yes, the theme was unquestionably aurora! Those remarks are characteristic of plenty more that appear later in the "quotes" in this summary. The disturbance itself was a lovely phenomenon to behold. The reason for the grousing, naturally, was the effect on QSO-per-hour totals and resulting lower scores. The overall club leader last year scored 24,327 points to the 1958 leader's 23,553. The top ten clubs in 1957 averaged 16,400 points to this year's 15,600. Last year's three top-ranking Class-B entries averaged 6600 points to 1958's 4200. The northeastern, midwestern and northwestern states, Canada and Alaska were especially hard hit.

Yet every cloud has its silver lining. Those well-equipped for 50- and 144-Mc. work, c.w. particularly, actually *enjoyed* the longest, most potent aurora session ever to occur in 22 Field Day holdings. Similarly, the long skip and north-south propagation dominating the low-frequency bands were a break for stations in the southern latitudes, where some Fours, Fives, Sixes and Caribbean entrants registered record-busting tallies for their areas.

For those in the aurora belt who were bitterly disappointed in their results, there's this redeeming feature. It should be a breeze to improve in 1959. *Just wait till next year!*

Anyone laboring under the delusion that the 1958 Field Day was a flop should examine these statistics:

Number Afield	*1957*	*1958*	*Improvement*
Hams participating	10,264	11,316	up 10.2%
Portables & mobiles	963	1086	up 12.8%
Separate xmtr-rcvr combinations	2394	2629	up 9.8%

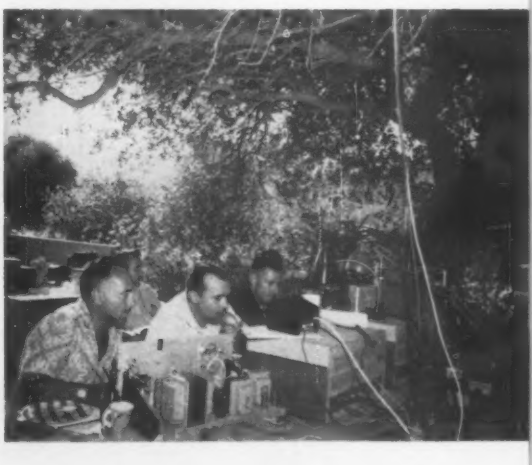
And so the picnic-type funfest chugs along attracting roughly five times the amateurs in the 1957 Sweepstakes, seven times as many as the 1958 DX Competition, and ten times as many as the 1958 V.H.F. SS, thus maintaining its position as ARRL's most popular spot activity, bar none.

Moving up a notch, Garden State Amateur Radio Association's W2GSA/2 netted 23,553 points and 2590 contacts, both tops for the 1958 Field Day. The 43 ops counted on 11 transmitters, all using 829 or 6146 final amplifiers at 30 watts. Maximum use of bands and modes played a major part in GSARA's success. Of the 2590, 985 QSOs were c.w. and 1605 phone. Best band was 20-meter A3 worth 386 while v.h.f. paid off handsomely at 363. S.s.b. accounted for 14 per cent of all phone work.

Another New Jersey outfit, the Tri-County Radio Association of Plainfield, was next with 18,711 points and 2064 contacts. Using 12 v.f.o.-controlled rigs, a humming 6-kw. generator, and lots of code on v.h.f., the gang also found s.s.b. a valuable score-booster. Hottest spectrum portion proved to be 21-Mc. phone, good for 258 QSOs. The menu included steak and beans Saturday evening, soup and snacks at midnight, bacon and eggs for breakfast and a lush roast beef dinner Sunday. Obviously the commissary committee kept the 56 tummies at W2LI/2 well filled and merits plenty of credit for Tri-County's high standing.

Third among club portables was Fordham Radio Club's W2JIO/2 with 17,793 points and

Left: Members of Irvington Radio Amateur Club, W2ODP/2, cluster 'round genny in wee hours to solve eternal Field Day riddle: "Why did the darn thing conk out?" Those shown include W2WDZ with instruction book and saddened Chief Op W2ZMH, now QRT, holding up tree. Right: Greenery abounds for (from left) K6UVK, K6EQT (eclipsed), K6QWB and K6ZVY of Aerojet Amateur Radio Club's W6IJK/6. The Jackson City site is near spot where gold was first discovered to precipitate California gold rush of late 1840's. AARC scored 4731 in 3A.



The Garden State Amateur Radio Association gang faces the camera happily after racking up the top score and contact total of the 1958 Field Day. Text has details on W2GSA/2.

1952 stations worked, a superb showing for just eight transmitters, as W5SC/5 of San Antonio Radio Club landed fourth position courtesy of 16,050 points and 2099 valid contacts.

Here are the other 14 setups that broke 10,000: W1OC/1 14,904, K6DTA/6 14,796, K2AA/2 13,401, W6UF/6 12,786, W2VDJ/2 12,537, K6EA/6 11,859, K6BAG/6 11,823, K6BF/6 11,124, W2OYH/2 11,061, W2GTD/2 10,818, W3RCN/3 10,584, W7HZ/7 10,467, W2OR/2 10,212, W9RK/9 10,134.

Inasmuch as competition for Field Day honors under the rules is betwixt stations employing like numbers of simultaneously-operated rigs, it is fitting that ARRL send kudos to these 13 clubs, all winners in their respective classes, and identify them in large type for all to see:

Class	*Call*	*Club Name*	*Score*
1A	W5EKK/5	Manzano . . . Soc.	6534
2A	K2FC/2	Order of Boiled Owls	6525
3A	W4FU/8	Ohio Valley AR Assn.	9954
4A	W2OYH/2	Morris RC	11,061
5A	K6BAG/6	Pacific RC	11,823
6A	K2AA/2	South Jersey R Assn.	13,401
7A	W2VDJ/2	Lakeland AR Assn.	12,537
8A	W2JIO/2	Fordham RC	17,793
9A	W1OC/1	Concord Brasspounders	14,904
10A	WØGM/Ø	Cedar Valley ARC	2640
11A	W2GSA/2	Garden State AR Assn.	23,553
12A	W2LI/2	Tri-County R Assn.	18,711
13A	W6UF/6	Eimac Gang RC	12,786

For geographical comparisons, study these call area leaders:

W1OC/1	14,904	KL7AA/KL7	1290
W2GSA/2	23,553	KP4WV/KP4	5472
W3RCN/3	10,584	KZ5AF/KZ5	9078
W4NVU/4	5904	VE1AEP/1	2250
W5SC/5	16,050	VE2CB/2	2205
K6DTA/6	14,796	VE3NAR/3	4740
W7HZ/7	10,467	VE5MA/5	240
W4FU/8	9954	VE6NQ/6	1278
W9RK/9	10,134	VE7ARV/7	3375
WØRFU/Ø	4272	W2ZRX/VO1	942
KH6RS/KH6	5517		

Sixes monopolized Class 1B, paced by battery-juiced K6GOI/6 and his buddy W6AWP with 4725 points, 323 QSOs, after which came K6QIK/6 and K6QHZ and their score of 3969. Third-high tally among all unit-individuals and leading one-man station was W3MSR/8 who got 3842 points and the top Class-B QSO total of 402. Other outstanding scores: W2JBQ/2 3416, W6DUS/6 3096, K4KUZ/4 2448, K5DRC/5 2403, W6IXK/6 2400, top Novice KN2LFK/2 2309, W8MZA/8 2232. Over in 2B K5DCO/5 and K5DGI went great guns for 370 contacts and 3330 points. Also in there were K6HGF/6 2880, VE2NI/2 2646, K4DTI/4 2529.

Cleveland's Westpark Radiops received and relayed hundreds of FD messages to continue their mastery of the club mobile aggregate listings for the sixth straight time. With 32 mobile units active, their 71,717 aggregate was down a hair from previous years but still good enough to command first place in a walk. Member W8PVC/8 led Class 1C in contacts and score with 280 and 5036 respectively. Then came K6EPC/6 and second op W6HBF with 213 stations worked and 3213 points, although the pair found out 15 minutes before zero hour that "some dope in the service station had charged our battery backwards!" Thirty of the next 31 mobiles in the one-rig listing are Westpark people. A crew of nine used the call K2TOM/2 aboard the Yacht *Blue Lady*, cruising in the Atlantic off Sandy Hook, N. J., to take Class 2C honors with 4361 points and 298 contacts.

This is *QST*'s lengthiest Field Day report. More scores, more photos, more soapbox, more everything. We hope every reader enjoys the info, and we extend our sincere thanks to every amateur who helped make the 1958 Field Day the greatest emergency exercise of all time!

Quotes

"It always seems that 101 things come up that you don't count on. We had a site not far from our homes, our fourth year there, so that we could get spares in a hurry. We spent two week ends beating down the brush and wetting down the ground so stakes for tents and guys would hold. We laid out a fire hose on account of high grass all around

It all began in early June when Texans W5FDB and W5GMV got a modest emergency-powered station going in a sort of FD warm-up. Situated at a boy scout encampment on Lake Houston, they handled much traffic. Then W5FDB recalled he had to return home for business reasons and disaster struck. As he drove away, the coax of the 50-Mc. beam caught on the rear bumper of his truck and dragged down the beam. Not stopping there, he hauled all the equipment out of the tent and the whole caboodle went bumping along the road behind him. W5GMV chased him yelling "stop" to no avail. That's how W5FDB went mobile in a most crude and destructive manner.

The multitransmitter boys with their tons of paraphernalia have long wondered how to complete the post-FD tear-down and get home as soon as possible. Obviously W5FDB and W5GMV have solved the problem!

and, sure enough, one genny caught fire! G.I. field phones were strung between positions, which were separated as far as the rules allowed; these kept us in constant touch and hourly reporting of scores helped along competition between stations. Also, a p.a. system was available to announce chow, etc. A special plea for help in tearing down and clearing out brought additional members to the site to lend a hand when the rest of us were dog-tired. We did better than ever before but can still improve. For instance, there were points to be made on 160, and 220, 28 and 21 Mc. were not milked dry. Interlocking transmitters should be tried too. We're anxious to compare logs with other groups but some won't share their special FD secrets. Guess we wouldn't either, if we had any!" — *Rio Hondo RC, K6ACF/6.* . . . "Too many complications, too many gizmos. Besides the headaches of set up and equipment familiarity, we were QRT 45 minutes with a faulty t.r. switch we finally got wise to." — *Manzano Mt. Moonshine & Rhombic Soc., W5EKK/5.* . . . "Excellent cooperation from the Red Cross and a fine site at the Minnesota State Fairgrounds with a Red Cross donated Bloodmobile which has its own 7.5-kw. generator." — *W0DKI/0.* . . . "We had good luck with W3LYP's t.r. switch ("An Electronic Transmitter-Receiver Antenna Switch," October 1957 *QST*) on break-in c.w." — *Bayshore RC, W5OIJ/5.* . . . "Ultra-modulation proved very effective." — *W6QWK/6.* . . . "Conditions lousy most of the night, especially on 80, and our score is far below last year. Lots of fun anyhow." — *Brass Pounders ARC, W8FWQ/8.* . . . "Location on high bench below summits of mountains (near Boulder, Colo.) seemed to eliminate lightning hazard as storms passed higher or lower. Suggest home stations use more care in keeping check to avoid duplicating QSOs with portables. Fixed stations usually have more convenient operating positions for this. All our dupes were made after a change of shifts; remarkably enough, no single shift duplicated a contact." — *Boulder ARC, W0IA/0.* . . . "Conditions were much worse than last year, resulting in fewer contacts even with improved equipment and antennas." — *Old Dominion ARC, K4VLW/4.* . . . "Our kw. generator ran 24 hours without letup but breakdowns slowed us down. Glad to see so much activity on 6 meters." — *Des Moines Tech High ARC, W0GHZ/0.* . . . "The generator ran out of gas once and refused to start twice. A bearing froze in the final tank of the rig and we were off until we oiled it. Our score is down but a good time was had by all." — *Muskingum AR Assn., W8INS/8.* . . . "The gear ran perfectly for the first time. Although we had some close competition from W7ZLC/7, 100 yards away on the same hill, very little interference was experienced." — *Benson Polytechnic School ARC, W7YK/7.* . . . "At a U. S. Forest Service tower, Fort Braden, Fla., we had to haul the Viking, two HQs and other gear up an 85-foot stairway. Must have gone up and down those steps a thousand times. W4DKT had to spend the next two days in bed. Weather perfect but nearby high-tension line made 40-meter daylight work n.g. The single-wire Windom really got out. Plenty of coffee and pop, fried chicken, few mosquitoes. A young visitor who got his toy gun tangled up in the generator governor caused an anxious minute." — *W4DKT/4.* . . . "When the 120-foot tower collapsed shortly before the start, most antennas (and interest) were lost." — *Williamantic RC, W1CQO/1.* . . . "The best one yet!" — *Harrison Emergency Communications Assn., K0DGL/5.* . . . "Enjoyed my first FD but almost broke my neck using pole-climbers to erect trap antenna. We'll be out to win next year." — *K2SOL/2.* . . . "Conditions poor but 20-meter vertical worked nicely and we expect to use more verticals in the future." — *Blossomland AR Assn., W8MA1/8.* . . . "To reduce Viking II input to 30 watts, 110 v. primary of h.v. transformer was lifted and hooked to a 5-amp Variac to control output voltage to 300 v. at 100 ma. Screen grid and bias on modulator tubes were then adjusted at this voltage to provide proper modulation." — *K9DVF/9.* . . . "First dry FD in years but oat bugs were a fright and breakdowns held score down. Got the sunburn of my life." — *K0DEX/0.* . . . "Our transmitter was 'manned' by mother, son and friend, a real family FD." — *K9GBB/9.* . . . "A homebuilt s.s.b. final worked fine until it blew up. The antenna was an 80-meter doublet cut at the proper places with insulators which could be shorted for various bands. Naturally, it was strung on a rope and pulley. Power came from a 1½-kw. gas generator supplied courtesy of MARS, Lockbourne AFB." — *Military and ARC of Ohio State Univ., W8LT/8.* . . . "Wonder what kind of multi-

Houston Amateur Radio Club crew erects two-element 21 Mc. beam, which was on the air moments later. W5DPA/5 got 5979 points in 8A.

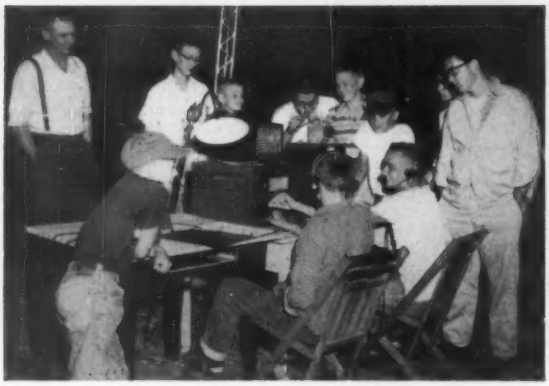
pliers the mosquitoes get. They had more fun than we did." — *W9DFV/9*. . . . "With a water tower as mast for our 8-element 50-Mc. beam, we found we couldn't transmit east until the tower got wet." — *K9LFO/9*. . . . "Our location was 2450 feet high and though the road up was bad, you can't stop that old ham spirit. Weather excellent for a change. When genny troubles stumped us, we contacted W3RCI in Wilkes-Barre and he got us a replacement, after which everything went FB." — *Wyoming Valley ARC, W3GH/3*. . . . "Despite the flutter, conditions seemed fair. There was certainly plenty of QRM." — *Carroll County AREC, K4SGI/4*. . . . "The full club membership voted not to take part so a few of us entered for fun. Gear was borrowed and dragged to the farm of K2CTX's father. With wood ticks prevalent, aurora overhead (all N. Y. C. b.c. stations were knocked out) and the generator having fits, we still enjoyed ourselves. Hope we didn't show *too* badly." — *Somerset Hills RC, K2ESU/2*. . . . "When we got to the site early Saturday we had every intention of using multiple transmitters and making many points. One misfortune followed another, however, and we ended up with one flea-powered rig. When the equipment was fired up our 2½-kw. genny threw a rod. Luckily we had a PE-108 backup. Then the 6146 in one rig blew after three QSOs and no spare. Another fellow who tried to make a contact with his factory xmtr promptly burned out a modulator tube socket. All this before FD had even begun! All we had left by this time was the 20A s.s.b. exciter which functioned efficiently on 20 c.w. the entire 24 hours." — *Alamogordo ARC, K5LRW/5*. . . . "A fine affair for the whole group. The feed line on the Windom loosened at 0300 but we had it down and back up in eight minutes. Used tent for operating and camp trailer for kitchen and sleeping, but who sleeps on FD?" — *W6MTW/6*. . . . "Transmitter broke down, generator had small tank which needed refilling every two hours, and gnats were thicker than hair on a hound. Then aurora hit us at midnight. Despite lowest score ever, we had a swell time and are already planning for 1959." — *Sioux Falls ARC, W0ZWY/0*. . . . "Our site was near a favorite necking nook but we scared off the prospectors. One op zero beated and called an image for an hour — nuts to the gear!" — *Ruston RC, K5NBD/5*. . . . "We had an HT-32 on s.s.b. for the fellows to enjoy between shifts on the Viking. Made 90 s.s.b. QSOs too." — *Cenois AR Assn., K9HGX/9*. . . . "Three commercial rigs conked out and we pushed a stuck auto for 45 minutes before discovering the emergency brake was on. Despite inexperienced ops, poor antennas and malfunctioning equipment we at least made a showing. To quote an old saying, 'Wait till next year.'" — *Mumford High School ARC, W8GMP/8*. . . . "Many members had never been out before so we should do better in 1959. We expect to begin earlier because activity seemed to drop near the end." — *Society of Radio Operators, W9NGI/9*. . . . "Re the rules, please don't change a thing! We like everything as is. Had the time of our lives until 40 went dead." — *Richmond AR Assn., W9PSD/9*. . . . "Uncontrollable generator output made receiving difficult. Future antennas will be cut to band and fed with nonresonant feed lines." — *Meriden ARC, W1SBF/1*. . . . "Doing the Monday morning quarterbacking, we are at a loss to detect the reason for the poor score. Band conditions weren't good, one rig which works perfectly at home wouldn't function properly, and another did less satisfactorily than expected. All in all the weather, generators, tents and other physical facilities were good. Conelrad requirements were met by use of a b.c. set and a portable RACES transmitter-receiver unit." — *W9QAB/9*. . . . "Despite hostile natives, ignition noise and a W8 kw. three miles away, we had a ball!" — *Fremont AR Communication Engineers, K8BXD/8*. . . . "Magneto failure on power plant cut us off early." — *W0RRP/0*. . . . "Scoring system for FD is excellent but the system for ARRL v.h.f. contests is rotten." — *Lombard 6 Meter Emergency Radio Corps, K9BDI/9*. . . . "Poor conditions, xmtr and antenna trouble, and confused hams accounted for our dismal score. The local YMCA let us use a cabin with eight bunks and one bed, also their shower and freezer. This was our third year and we wouldn't miss FD for the world!" — *Albert Lea Area Spider Web AR Assn., W0VEM/0*. . . . "Would like to see the Americans look over our frequencies more, because our low power doesn't cut the mustard in the W/K phone bands." — *Moose Jaw ARC, VE5MA/5*. . . . "The new Novices were amazed at the difference between copying code from a machine and on the air. Their earlier training included copying W1AW evenings but the FD QRM was something else again. Certainly a great chance for our Novice youngsters to get in there and work with the best of them." — *Hillcrest YMCA Junior RC, W8SZF/8*. . . . "Wx perfect, condx punko." — *Order of Boiled Owls, K2FC/2*. . . . "Please don't tamper with the FD rules. Let's leave them as they are." — *Elizabethtown Area Gang,*

At W2GSJ/2, smiling W2SEI adjusts link on coupler as W2GSJ peaks the receiver and W2WS prepares to log on behalf of Radio Amateurs of Greater Syracuse.

Electric lift makes short work of W6UF/6 antenna upping. Here W6MUC makes last-minute adjustments to the 10-meter rotary. Eimac Gang got the second-largest Field Day contact total of 2449 with 13 rigs.

W3MFW/3. . . . "The full June moon lent a romantic atmosphere atop the Santa Monica Mountains and kept the ops going strong all night. The ever-increasing number of participating stations is most gratifying." — *Crescent Bay Emergency Net, K6LDA/6.* . . . "Good operators, good equipment, good weather, horrible conditions. What a revolting development!" — *W3ISE/3.* . . . "The generator worked perfectly throughout and was economical in gas consumption, using less than 15 gallons in over 24 hours. It furnished power for transmitters, receivers, the coffee pot and lighting. No equipment breakdowns but plenty of operator breakdowns." — *WA6AHM/6.* . . . "Weather perfect with not a drop of rain for a change. Lots of FB operating but the aurora made contacts hard to come by." — *Suburban Colonels, W4CV1/4.* . . . "Three stations were set up but an interlock system kept the number simultaneously operated at two. We used 6.3 volt pilot lights and the auxiliary contacts on antenna relays to show the 20-meter op when 80 was active, while the 40-meter rig operated alone." — *Prairie Village Teenage RC, W0WWA/0.* . . . "Believe it or not, no rain!" — *Friendly AR Transmitters Soc., W3QJJ/3.* . . . "We had a contest with the Jefferson City club, the loser paying the bill at a banquet honoring both groups. We received good coverage in the local paper." — *Daniel Boone RC, K0JAD/0.* . . . "Although we had trouble with both cars in the 100-mile jaunt to our Vermont site and although it rained all day Thursday as we put up tents and although we got out like a ton of bricks until FD started and although conditions were awful during the night and although three ops fell asleep at the rigs at 0400, we still improved last year's score." — *Royal Order of Left-Handed Chicken Pluckers, W1DZV/1.* . . . "Our 7-Mc. c.w. rig was handled by new Generals on their first FD as operators. Last year they ran errands and gassed the genny." — *Kokomo ARC, W9DKR/9.* . . . "Conelrad monitor provided musical entertainment at the cooking-eating area. One fellow, returning from sleeping in his car at 0400 and greeted by a version of "The Purple People-Eater," commented that it sounded like a rock-and-roll session was on." — *Raritan Bay RA, K2OML/2.* . . . "We'll never use separate receiving antennas again." — *Woodlawn RC, K2VTL/2.* . . . "For a change the weather was ideal but evening operations were hampered by the brilliant aurora. As usual FD was lots of fun and well worth the effort. Publicity included a broadcast from the site by the local station." — *Kalamazoo ARC, W8RYI/8.* . . . "All equipment functioned perfectly and once more all those thousands of great operators were out in force. FD is the super ARRL activity!" — *W5CCH/5.* . . . "Most unusual: the generator ran perfectly for 24 hours. We drove by a local club right before FD and sent some nasty words in c.w. on the horn, whereupon some ham on the tower waved his fist to return the 'good luck and best wishes.' Condx nothing special but the weather was beautiful and we doubled our 1957 score." — *Cut-Throats RC, K2KFJ/2.* . . . "We feel that the multiplier gained by using 30 watts is not worth the extra effort. Had we sacrificed it and used 150-watt rigs, we believe we could have made up the score in more QSOs. The key clicks and phone interference encountered between our two stations seem to indicate that one rig on all bands and modes with plenty of operators might have been better." — *Martinsville ARC, W9ZSK/9.* . . . "Six meters terrific with contacts in W2/3/7/8/9/0 and VE1 and VE3 for ten states and two provinces. Excellent QTH in Pokagon State Park, one of northern Indiana's highest points. The low-band boys said conditions and antenna troubles killed them, but during the 'red aurora' 50-Mc. phone signals had almost local quality. Received publicity in form of movies taken at site and personal appearance of members afterwards on Fort Wayne's WANE-TV." — *Indiana, Michigan and Ohio V.H.F. Club & Northeastern Indiana RC, W9QWI/9.* . . . "From the standpoint of score, this was our poorest FD in recent years. But the laughs made up for it and we look toward the next one with this strong resolution: no more trap antennas." — *Keystone ARC, W3PSH/3.* . . . "Never heard conditions so bad in past ten years." — *Walton Ham Group, W2THO/2.* . . . "A bang-up time, especially because this was the first year that we, the hams of Lincoln, Illinois, attempted such a project. The cooperation received from civic and c.d. officials and news and radio organs was marvelous. But without the aid of the mayor, whose son is a ham, we would never have made it. So here is our score in spite of lousy bands, poor planning, one generator mishap in which oil was added instead of gas, and a lot of tired ops who set up three days ahead. We hope to be able to take part again. I am sure that it has spurred enough local interest to get a club and some c.d. radio emergency organization. Already a meeting has been called to discuss these matters." — *W9PSL/9.* . . . "Very gratifying to see our Novices battle out the totally new problems of FD operation, an experience they will never forget. In spite of their low score, I rate them tops because of their persistence and hard work." — *K8AJD for KN8HAS/8.* . . . "Cut for the low end of the c.w. band, the 80-meter dipole wouldn't load properly in the A3 band so next year we will use two dipoles with snaps for easy, quick changing in the dark. Much fun but we are disappointed at the score. Aurora knocked us out for four hours." — *Short Skip RC, W3DVB/3.* . . . "Antenna trouble on low freqs, per usual. K2QLE brought his homemade telescoping 30-foot tower with halyard which made working on the long wire a cinch. Next time same deal but up 60 feet." — *K2KIR/2.* . . . "80 and 40 poor but quad did FB job on 20, although we need better system to eliminate repeats." — *Greene ARC, W2QH/2.* . . . "In view of the fact that we were in a cow pasture, we don't recommend that antenna installations be changed in the midnight darkness as we did. Hi!" — *K9NRN/9.* . . . "No shelter but mesquite bushes and the mosquitoes and chiggers were a fright. Learned a lot in our first FD attempt." — *Women Ham Operators of Texas, K5QHI/5.* . . . "As the years go by and the number of Field Days pile up, things seem to be getting smoother all the time. This year everything went together like a jigsaw puzzle done for the hundredth time. By using sound engineering principles for tower construction and adhering to strict safety practices, setting up the antennas was simple and the energy saved was available for contest work, catching flies, chopping wood and waking up the next relief shifts. We found the following made for a more efficient operation: all power equipment packed in wooden cases properly identified, and similar packaging of antenna equipment for easy access; floodlights for night rigging of tents, unloading of cars and trailers, and preliminary station and antenna layout; time spent prior to FD in setting up relay control and antenna-matching units paid off; each station responsible for setting up own control systems and antennas, with everyone working together on main jobs where extra effort required; excellent cooking facilities to keep the 'inner man'

"Have we worked him before or not?" wonders K5AEX, as he thumbs through the 75-meter phone log of the Kilocycle Club of Fort Worth. W5CF/5's 5658 points ranked fourth in 7A.



Novice position at Central Illinois Radio Club, W9AML/9, attracted its quota of kibitzers.

well fed." — *VE2CB/2.* . . . "Our thanks to ARRL for making FD possible. A suggestion for club secretaries: get an alphabet and numerical sample of handwriting from each operator to expedite preparation of an accurate log for submission." — *Hialeah ARC, K4AA/4.* . . . "Bands poor compared to last year when we made a fair score as W1ZKE/1 from the same location. Best band seemed to be 6 meters. Unusual extended ground wave conditions on 10 meters lasted from 10 P.M. to 2 A.M." — *W1HGE/1.* . . . "Although Murphy's Law (p. 60, December 1956 *QST*) struck early with loss of one car and all tents, Field Day turned out well and was most enjoyable here." — *Albany Park ARC, K9CDI/9.* . . . "Our small, 15-man club has consistently done well in Class 1A and in 1957 moved up to win in the two-transmitter category. This time we tried 3A and found ourselves plagued by mutual interference and Murphy's Law, and undeniably outclassed by larger groups. Next year, back to one rig where we belong!" — *Connecticut Wireless Assn., W1EIA/1.* . . . "We had 5000 feet of twisted-pair which we unwound into two 5000-foot sections to cut for skywires, a job that took about five hours. First FD for our club which was started about a year ago. Everyone enjoyed *himself* — no YLs along, darn it!" — *Oxford Circle RC, K3AGX/3.* . . . "Never thought we'd make more QSOs on 2 than 75." — *Wethersfield High School ARC, W1FYF/1.* . . . "Stress importance of doing as much work on antennas and facilities at the site as far in advance of FD as possible." — *Putnam County AR Assn., K2ZOG/2.* . . . "We found the best way to keep the bugs from frying on hot resistors in the equipment was to unscrew the pilot lights attracting them. Whenever any kids got in the way we sent them home for a skyhook." — *K9GUY/9.* . . . "Although the score wasn't high, we proved that an emergency could be simulated and communications established under adverse conditions. Cedarville Forest, Md., consists of very dense timber which distorted our radiation patterns considerably. We anticipate a larger score in 1959 but feel that this is secondary to the main idea of being prepared for an emergency." — *District Heights RC, W3CVE/3.* . . . "Rig burnt up due to removal of load from generator but we had a good picnic, an excellent new cook (VE3EIJ) and a great time." — *Kingston ARC, VE3BEO/3.* . . . "Trap antenna north-south and long wire east-west functioned nicely. Surprised to work KG1BB and KG1DT in warm-up period with only 20 watts." — *Shoshone County ARC, W7UAK/7.* . . . "The halo constructed by the members worked well, being easily mounted and nondirectional. All men in the club are c.d. personnel and equipment employed would be used in time of disaster. The opportunity to try out our methods and gear was welcomed although it appeared that high-powered home stations had a definite advantage in pushing through to acquiring much higher scores." — *Windhams RC, K1DJH/1* (Sorry, it ain't true. Home entries running over 150 watts must make *nine times* as many QSOs as a portable 30-watter to earn an equivalent tally, a feat nearly impossible in practice. — W1ZDP). . . . "Greatest troubles: generator refusing to start, and nine hours wasted trying to make a contact on a Windom with a broken feeder near the flat-top connection. Biggest goof: not sending our FD message. Publicity included plugs over KDEC (Decorah, Iowa) six times and presence of photogs for local papers. Worst condx ever experienced but the gang was talking about next year before we had even secured the rigs." — *Tube & Shutter Club, W9CVJ/0.* . . . "Our first try and we selected an awful location amidst lots of trees and antennas proved far too low. Not enough fellows volunteered either. See you next year with better setup." — *Nafi ARC, K9NBK/9.* . . . "FB generator and FB conditions weather and radiowise but we had crummy antennas and rotten equipment. The ops didn't amount to much either. Of course, we learned a lot and, as everyone always says, 'Wait till next year.'" — *Owen County ARC, K9EOH/9.* . . . "Balloon antenna worked well on 75 but collapsed after five hours. Next time we'll try cloth instead of plastic balloon." — *Northeast RC, W3TYU/3.* . . . "First time in club history that FD was a complete success. Decided to gamble everything on low power and a good location at south tip of Miami Beach practically surrounded by salt water. Three DX-40s, one 310B and one Ranger assured continuous operation of three rigs. Generator was backed up by two spares which were never needed. S.w.r. meters on all antennas helped keep power into place it would do most good. Usual Florida rain came only after all antennas up and rigs operating. XYLs alternated between operating, logging and serving chow. One sad item: no one remembered to bring a camera." — *Dade RC, W4NVU/4.* . . . "Great weather added to the enjoyment of all, although the aurora caused trouble to the boys trying to pull in that extra contact. A fine workout of our club-owned emergency equipment." — *Livingston ARC, W2MO/2.* . . . "Our site at Bull Run Mountain is near the place where the Civil War battle of the same name was fought." — *ARC of Falls Church, W4PAY/4.* . . . "Our new club call, which belonged to the late Cy Read, attracted much attention. OMs who couldn't believe their ears said 'W9AA???'" — *Hamfesters RC, W9AA/9.* . . . "All three stations were getting out like crazy until early morning when the bands went out. Generator purred like a kitten and the weather was fine. Improved last year's score by 300 per cent." — *Mike & Key Club, K4GDL/4.* . . . "We cussed something awful when *two* gas generators went out until we stopped to consider what Field Day is for, to put pressure on the weak spots. Spent ten hours getting a ten-meter beam 180 feet high and not one single contact. The band never opened up here." — *Old Natchez ARC, W5KHB/5.* . . . "The entire exercise was a great success, especially because of the many s.s.b. contacts made. No interruptions, not even a blown fuse. Good planning paid off. If *only* the bands could have been open." — *Naval Air ARC, W4NEK/4.* . . . "No malfunction during the 24-hour period. Excellent coverage received in the local newspapers." — *Lynchburg ARC, K4HEX/4.* . . . "One FD Hink & Hink learned was to keep the gas can away from the starting battery's terminals. While filling the generator at 0200 we had the metal nozzle of the can resting on the filler pipe of the generator's gas tank. While setting the can down it accidentally touched the anode of the battery and shorted through the can nozzle to the generator. Sparks flew! Whew! The batteries were moved." — *Chiburban Radio Mobileers, K9ATM/9.* . . . "Suggest that scoring consideration, given on basis of

setup-time required, would help emphasize emergency aspect of FD." — *R Assn. of Western New York, W2PPY/2.* . . . "Best ever, absolutely no trouble of any kind. Began pitching tents, antennas, etc. a full week before, and tested all gear Friday and again Saturday. Tri-band quad was especially built for FD and tower used was a trailer-type crank-up TV outfit. Swell turnout, lots of food for 75 guests at two picnic meals. Planning paid off and we are better prepared for any emergency that might arise." — *Montgomery County AREC, W9VWJ/9.* . . . "Boy, did they all come back to our YL operators! We did very well under the new call and even doubled last year's score." — *South Side RC, K2LAK/2.* . . . "Very poor. Bad aurora wiped out phone completely and six out of seven available transmitters failed in one way or another." — *Chicago ARC, W9CAF/9.* . . . "Low power of 50 watts or so will not compete in the lower bands any more — much different from 12 years ago. We received publicity in our local newspaper and TV coverage on Channels 4 and 9 in Oklahoma." — *Enid ARC, W5HTK/5.* . . . "Greatly aided by the cloudless night and near full moon when fueling the generator, also overhauling it at 0300 when it decided not to run." — *K2SWI/2.* . . . "First FD for us, all between 13 and 15 years of age. A scoutmaster lent us a tent and we had saved our money for food, gas, cokes, etc. Not much sleep but heavy on the eating and operating. Within 30 minutes after end of FD, everything was cleaned up and packed and we were on our way for a shower and some sleep." — *Delaware Township High School RC, W2MBC/2.* . . . "Although our total was considerably less than previous ones, this year was one of training for the many young operators who almost wholly staffed our positions. Our club always uses FD as a chance for emergency practice inasmuch as we are the emergency communications group for the San Fernando Valley chapter of the American Red Cross. Our entire operations were recorded in 16-mm. sound motion pictures by a member who is a professional cameraman." — *San Fernando Valley RC, W6SD/6.* . . . "Most of our participants were newcomers to ham radio. We made many mistakes but nevertheless had a good time and profited considerably from the experience. Our location was unique; we were in an underground naval gun emplacement which has been abandoned since World War II. Our 15-meter a.m. position was 60 feet underground." — *Air Force ROTC ARC, KP4FAE/KP4.* . . . "HARC took along the Halifax e.d. 40-foot trailer, 10-kw. gas plant, and 60-foot portable tower, as well as club gear, for a full workout. This was a 100 per cent trailer operation, quite a change from the cosy cabins and cottages of former years!" — *Halifax ARC, VE1FO/1.* . . . "Push-to-talk or voice control very important, also *comfortable* headphones of the proper impedance." — *Boot Hill ARC, W0PMW/0.* . . . "Too much emphasis on liquid refreshment and not enough on ham radio at our setup, and wonder if other clubs keep as lousy a system of logs as we do." — *Pioneer RC, W0BGG/0.* . . . "For first time all rigs were checked out ahead and the rain was holding off. Everything seemed lovely but when starting time came propagation went to pot (WWV was sending W-2) and every contact was a fight. It ate the heart right out of us for it's the second time this has happened in four years. We ate very well, probably the only factor that kept our morale up." — *Detroit Metropolitan RC, W8WXN/8.* . . . "Importance of receipting for required FD information should be stressed. Some of the stations we worked did not wait, which caused loss of a few contacts due to missing information." — *W1BY/1.* . . . "We had trouble climbing a very high oak tree but after we got the 75-meter dipole up it worked fine. We didn't think the Windom would do well but we hooked Hawaii on it. Our army surplus generator, following two days of hard work on the motor, ran without a skip the whole period." — *K4JGQ/4.* . . . "The aurora knocked out 14 Mc. for Stateside QSOs for nearly six hours during the night. 3.5 Mc. was hit somewhat and 7 Mc. seemed least affected but antenna feed problems held us down. Once these were licked the boys worked everything they heard, but it was too late to help our meager score to any sizable extent." — *Mount Vernon ARC, K8EEN/8.* . . . "Last year we had thunderstorms, year before band went dead, this year aurora. Maybe next year nature will cooperate." — *South West Iowa AR Assn., K0GPV/0.* . . . "Weather perfect, our Kohler ran like a watch and mosquitoes nil, but next year we'll check for high line noise before we select a site. Thanks to increased interest and cooperation our score was 50 per cent higher." — *Wheaton Community RA, K9APM/9.* . . . The February 1958 *QST* ("A Three-Band Ground-Plane Antenna") job with 10–11–15–20 wire elements worked very well, even loaded on 40 meters. Please, phone stations announce your calls clearly so someone can understand them. Shades of T. O. M.!" — *Grays Harbor ARC, W7TZ/7.* . . . "Gang had a great time despite conditions. Ate up lots of groceries and drank lots of coffee and pop. Weather beautiful." — *Green Bay Mike & Key Club, W9IKY/9.* . . . "A 'Helite' camping trailer was used for the shack with excellent results. The shelf makes a good operating table with plenty of room for equipment in the storage compartment. We find that when the generator is put in a hole in the ground or in a ravine the noise decreases very much." — *WANE Television Gang, K9JKL/9.* . . . "We had enough spare juice even to run the Mixmaster for the sourdough pancakes." — *Electric City RC, W7ECA/7.* . . . "Side-by-side operation is certainly difficult unless all cross-modulation and key clicks are eliminated." — *Rogue Valley ARC, W7OEK/7.* . . . "Lack of advance work on antennas forced too fast setting up so had some QRM from our own harmonics." — *Terry County ARC, W5HPI/5.* . . . "Fine fun. We combined a picnic with an easy-going FD for a change!" — *Northern New Jersey R Assn., W2DAY/2.* . . . "A poor showing due to the aurora and noisy bands. Also troubled with high s.w.r. on trap antennas on c.w. end of bands, causing fuses to blow and knocking out our rig. Went after a BC548-ARC5 to fill in but when it arrived the power supply was out of commission due to jolting around. Much time lost repairing same." — *Elkhart ARC, K9HDH/9.* . . . "A 3-element beam for 15 sure paid off but the bands just weren't up to par." — *Walnut Hill ARC, K4IMA/4.* . . . "It is generally felt that, in spite of technical difficulties, more stations were worked than we can furnish proof of. We suspect that some log sheets were lost during several strong wind squalls that occurred." — *Baltimore ARC, W3FT/3.* . . . "Aurora caused negative results on all bands but 50 Mc. where we heard W4/5/6." — *Marathon ARC, K2VKZ/2.* . . . "All gear was homebrew with exception of the BC669 and HQ120X. Some difficulty from motor-generator ignition on 6 meters but a good time was

Old Dominion Amateur Radio Club maintenance man heroically strives to tidy haywire maze behind W4VLW 4's 1A setup. His call, appropriately enough, is W4TV!!

Picturesque night scene at W3ISE 3 two-rig installation features (left to right) SWL, W3BFJ, W3JEJ, W3GYL and W3DJD.

had on our first FD." — *W5ICE/4.* . . . "Nice weather, temperature 75°, many visitors. Poor conditions but interesting demonstration for c.d. people interested in communications." — *RC de Quebec, VE2CQ/2.* . . . "Ops were prone to forget to log contacts properly, probably because they're away from their home environment. Never put up a tent broadside to the wind; manufacturer's claims don't hold when stacked against strong gusts." — *St. Paul Mobile RC, W0REA/0.* . . . "Equipment was set up and operated Friday night, all day Saturday up to beginning time, then throughout the entire 24 hours without a single breakdown. A 55-gallon gas-drum-fed generator was never shut off. Heat from the generator was used to warm another 55-gallon drum of fresh water for hot showers." — *Pompton Valley RC, W2OR/2.* . . . "Following unsuccessful attempts to raise large mast sections, it was found to be easy and quick to raise one section at a time vertically while several hams steadied the guys. This doesn't require much foresight of course, but still might save a few shiny new beams next FD." — *Staten Island AR Assn., W2CWW/2.* . . . "Some of our old timers have decided to admit that 2 meters has finally arrived." — *Manchester RC, W1KKS/1.* . . . "6 and 2 paid off when the low-freq bands were poor." — *Newport County RC, W1SYE/1.* . . . "Please arrange to have the 10-meter band open next year." — *Lake AR Assn., W4YKY/4.* . . . "We don't have a brain in the club that can come up with a single suggestion to improve the event or the rules." — *St. Louis ARC, K0LIR/0.* . . . "Our four tents were set up in a treeless field and we used TV and push-up masts for antennas. Site ideal for picnics, fishing and swimming as well as FD. Generator started throwing oil after two hours but W3UGX came through with another to save the day." — *Harrisburg RAC, W3ZEK/3.* . . . "Aurora cut score in half." — *Edison RA Assn., W8AW/8.* . . . "Freak conditions resulted in more QSOs on 50 Mc. than on any other band. A fine pot-luck dinner was served by the XYLs noon Sunday." — *Grand Rapids AR Assn., W8DC/8.* . . . "We found t.r.-switches were useless for break-in — real good interference generators. S.w.r. bridges with diodes also can cause noise. Plans are being made for better antennas and layouts next year." — *Bloomington ARC, W9ARA/9.* . . . "How about a multiplier of 100 for all transistor rigs? Low power and good antennas are the key to success." — *K2ODT/2.* . . . "A good FD with no one hurt, lost, hungry or thirsty." — *San Gorgonio Pass ARC, K6QYF/6.* . . . "Six-meter beam made for $1.00 on the spot paid off well for our crystal-controlled 6-meter boys. Be sure to disconnect electric fences within a 5-mile radius. They are real QRM-makers." — *Shelby County RC, K9GVL/9.* . . . "With three spare units on hand, for the first time no power failures were experienced." — *North Penn ARC, W3BTN/3.* . . . "Mobiles are valuable in c.d. work since they are completely independently-powered stations. To encourage more such activity, how about counting 1.5 points for each mobile worked?" — *Fullerton RC, W6ULI/6* (Mobile activity is highly desirable, the more the better. But how could our checkers tell a mobile from a portable in a given log? — W1ZDP). . . . "Fine publicity in the newspapers. Forty visitors signed our register and there were many others, including a group of city officials. All seemed impressed by the extensive setup, and especially by the large graveyard tent which housed two stations, cots and charcoal grills." — *Paterson C. D. Emergency Group, K2MKV/2.* . . . "Score terrific considering conditions and fact that the 6 and 2 meter ops were unprepared for the aurora; no power, no c.w. men and no receivers to do much." — *Bedford RC, K1GAY/1.* . . . "As usual, the rain and lightning kept us from making many contacts. Our first try at s.s.b. was successful but c.w. reigned supreme as in the past with operators making more contacts per minute than on s.s.b. or a.m. We will lick mutual interference next year by using 500-foot placement between positions." — *Wheat Belt RC, K0BVX/0.* . . . "Be sure the antenna is connected to the receiver when on 'receive'; our 20-phone position had no receiving antenna for the first four hours! Another pointer: don't overfeed the help — they get sleepy." — *Valley ARC, W7HZ/7.* . . . "For 400 and 80 c.w. we have 30-watt transmitters and receivers of minimum size and good efficiency especially made for FD. Plate circuit efficiencies on the order of 70 per cent have been achieved. We hope to have more of this specialized gear available in the future." — *Watchung Valley RC, W2KOJ/2.* . . . "Four 40-foot crank-up towers were loaned to us by the local highway department. We strung 108-foot doublets between them fed with 450-ohm open-wire through Matchboxes. We are sure this gave us maximum effectiveness from our 30-watt power level, since our s.w.r. measured 1:1 on all bands! Our food committee served 16 of us a 12-lb. ham (pork, not amateur), two gallons of potato salad, an enormous quantity of eggs, bread, buns, baked beans, and uncountable amounts of pop, milk and coffee. A wonderful FD!" — *Marietta ARC, K8HIL/8.* . . . "Formerly we had difficulty with interference because the stations were so close together, so this year we took advantage of that 1000-foot rule to spread out. We still had QRM but much, much less. It was worthwhile stringing all that power cable." — *Seneca RC, W8ID/8.* . . . "Big grass fire, scorched tent, fire department showed up, plenty excitement." — *North Peninsula Electronics Club, W6PMK/6.* . . . "During aurora on 144 Mc. we heard W1AJR, W1FZJ, W2AMJ, W8MVN/8, W9KLR, W0SMJ. What a time for our 2-meter xmtr to be *on the blink!*" — *Greeneville ARC, K4EWE/4.* . . . "In addition to signal report and ARRL Section, how about exchanging calls of operators on key or microphone?" — *Houston ARC, W5DPA/5.* . . . "The Modesto Naval Reserve Electronics Facility made available a 7½-kw. generator, which was pulled to the site by a CAP jeep based at Castle AFB, Merced, Cal. The California State Forestry Service through its resident ranger reserved an area for our club. A Shell Oil distributor sold 50 gallons of gas to us at cost. A 50-cup electric automatic coffee maker was in constant use." — *Turlock ARC, W6BXN/6.* . . . "Weather balloon for 3.8-A3 was new kink. Brilliant aurora blanked out l.f. but helped 2, 6 and 10 meters." — *Pioneer Valley RC, W1AEW/1.* . . . "Erection and checkout of antennas the week before was a big factor in operational efficiency. 20-c.w. almost had a 50-foot tower to put the beam on but it buckled while going up. Fog that rolled in late Saturday raised heck with keys, shorting them out and causing some to be 'hot.' The XYLs did such a swell job on the chow that the cook tent was a very popular place." — *West Valley*

RC, K6DTA/6. . . . "More sideband used with moderate success. Weather excellent." — *Tri-County Radio Assn., W2LI/2.* . . . "Better antennas than last year but bands *not* good. Didn't get one wink of sleep but even so could not equal my 1957 Class-B score." — *W3MSR/8.* . . . "Operating techniques seem to be improving but one gripe: portables that don't *sign* portable as required." — *W6DUS/6.* . . . "Usual problems were met and conquered. Generator broke down, bugs attempted to eat the ops, terrific QRM, ran out of people to work, repeat QSOs, etc., but this only added to the fun." — *K5DRC/5.* . . . "A word to the wise: never try a Vee beam on FD. It may work well but the trouble and heartaches aren't worth it." — *K2UTV/2.* . . . "FD has been my favorite activity since about 1935. Would a multiplier linked with time required to set up a portable station be in line with what we are trying to accomplish with FD? Might not this encourage us to have our gear ready to go in an emergency in a minimum of time? Say, one hour or less, complete installation: × 3; from one to four hours: × 1½ or 2; over 4 hours: × 1. Don't believe any change should be made without considerable thought, however, and above suggestion is no exception." — *W7NQP/7.* . . . "Our 5763-5763-6146 rig at 25 watts was built especially for FD, takes five seconds to change bands. The 20-meter discone performed well enough to get 589 in KB6, and worked on 15 meters too. The 80-40 vertical raised no one until we found the coax shorted internally. The PE-75 power plant was a dog to start but just wouldn't quit once it got going. Watch out for next year's score without any breakdowns, I hope and pray!" — *K4LDR/4.* . . . "Temperature 31° and not prepared for the cool night. Brrrr." — *W7GZN/7.* . . . "Crummy generator blew up at 0300 Sunday morning." — *K2AZJ/2.* . . . "Now I know why a generator gives a multiplier of 3. The feller who promised us one withdrew his offer and we ended up on commercial power." — *W8FNI/8.* . . . "Even though I am a Novice I like to build gear and that's why I had only two contacts in eleven months. But I decided to work FD. I rigged up storage batteries and generator supplies and a 7-Mc. peanut-whistle and also fixed up my receiver for external power. I put up a tent under a tree not too far from the house and with the help of my kid brother, set up the gear. I was planning to use a balloon or kite but I couldn't get helium and the kite wouldn't go up. Used two 6V6s straight through on 7.175 mc. for 10 watts into a pi-net. Glad to get my FD message in to SCM W2TUK." — *WN2TNP/2.* . . . "Weather perfect but our spirits were dampened by the 'aurorific' signals. Wait till next year!" — *RA of Erie County, W2COU/2.* . . . "Items in short supply were cube-taps for power take-off, pencils, scratch paper, tent poles, can opener, matches, swim trunks, fly spray, ground rods, and large gas cans. Future need: precut center-fed dipoles for all bands." — *K0EUD/9.* . . . We demand the following multipliers: (1) 2 for having to go into an unauthorized army area to steal a light bulb at midnight; (2) 1.5 because K6SAF swiped the light undetected; (3) 10 when our trusty generator, after giving us 140 volts all evening, went up over 180 v. and blew transformers, resistors, filaments, etc. According to ARRL's incorrect method of tabulating, our score comes out 444. According to our *corrected* method we made 13,320 points!" — *K6SAF/6.* . . . "Bet I'm not in the cellar even with three QSOs. That FD message sure helps." — *K5GEM/5.* . . . "While FDing I noticed a boat on Lake Martin, Ala., sending code with its running lights. Using a spotlight, a contact was made with K4UDI. Does this blinker QSO count in the score?" — *W4HKK* (Ha! — *W1ZDP*). . . . "Only complaints were that no one would take our message and there were not enough Novices active." — *KN5QFL/5.* . . . "For three years I have been on FD with 20 watts or less, this time with 15. Up to 3 P.M. Saturday everything went fine, but then the high-powered boys got going. You hear a nice signal 'CQ FD,' zero your v.f.o., then a 250-watter slaps down on you and that's the end of that. The main purpose of the drill is not to see how much power one can run but to test out portable independently-powered equipment in the field. I request that ARRL make a rule that not more than 50 watts is the allowed input for all transmitters." — *W6IAH/6.* . . . "How about a multiplier for homebrew equipment?" — *KN8HVV/8.* . . . "All gear is homebrew, including the unmatched, unbalanced 4-element beam." — *K3AKR/3.* . . . "Watched the wrestling on TV while the bands were dead." — *VE4JW/4.* . . . "Generally speaking the affair was enjoyable, weather was plosh and mosquitoes light." — *VE2NI/2.* . . . "Bands were terrible. Our two ops worked 24 straight hours and then collapsed." — *K4DTI/4.* . . . "After hiring a week-end baby sitter, this XYL-OM combination went to town on FD, and our first effort in W6-land was a revelation. No storms, no bugs, warm all day and cool all night, and local stations by the bucketful. The comic relief was provided by a stable nearby. Horses were running by every few minutes and getting tangled in our ground-wire counterpoise system. By Sunday P.M. we were one exhausted family!" — *K6QIK/6.* . . . "Operating from the city dumps had its disadvantages and we had equipment failures, extremely heavy rains and a seven-hour drizzle, but a good time was had by all." — *Miami Springs RC, K4OSQ/4.* . . . "We rolled out of the sack at 5 A.M. Saturday eager to call 'CQ FD.' Assembling at K6BRZ,

Right: The 50-Mc. position at K9WBT/9, Ft. Sheridan (Ill). Amateur Radio Club, was in this helicopter. (U. S. Army photo)

Below: Fresno Amateur Radio Club's two stations were in an emergency trailer and a surplus bus owned by W6DVL. Joining in W6TO/6 generator conference are (from left) W6DVL, K6ZMW, W6JPS, WV6AFW and K6VLG.

we piled into a station wagon and Buick and started the long trek to South Hawkins Peak, 7782 feet up in the Angeles National Forest. The monotony of the drive was broken by continuous 2-meter operation between the two vehicles. After five stops to refill boiling radiators on the road up we arrived at the top of the world and began erecting antennas, pitching tents and getting as comfortable as possible. The generator started all right but the output fluctuated from 90 to 125 volts. After the carburetor was cleaned, the darned thing ran like a charm for the full period. At 2:00 P.M. bedlam broke loose and our receivers on 2, 6 and 15 meters sounded like every ham in the U. S. was calling CQ. We made contacts feverishly, one extra man always ready to aid in logging when a band was hot. Finally at 2:00 P.M. peace again came to South Hawkins Peak. (The generator had run out of gas at precisely the right time.) We painfully dismantled the stuff and loaded up the cars for the long drive home. Needless to say, there was little mobile work on the trip back." — *Collins Radio Co. ARC, K6BRZ/6.* . . . "We were testing the gear two hours before starting when the generator quit after running five minutes, but W5YLP found that beach sand made good grinding compound for the valves and had it going fast. It ran 24 hours without further difficulty too." — *Brazoria County ARC, K5GOI/5.* . . . "Excellent luck with weather, rigs and power. Only troubles were 20 closing down and a zooming s.w.r. on one skywire. Nevertheless we'll be back with bells on in 1959." — *K5GHP/5.* . . . "Only advance preparation was the erecting of a 2-element 15-meter beam. We left town at 3:15 P.M. Saturday and got on the air at 4:45 after quite a tussle with the generator, a true approximation of emergency conditions." — *Harlo ARC, W7TRU/7.* . . . "Preparations began in March and a lot of 'wind' went into the next few meetings. April 20 having been chosen as a date for a trial, committees were appointed to see to antennas, power supplies and other gear. April 20 dawned with a torrential downpour unexpected and unwanted but the hardiest members proceeded to the site and by evening had become thoroughly soaked by the elements and the FD spirit. Only one rig was operated but this small start was enough to point up to the need for future preparation, and the ragchews from a portable station were a new experience. The first trial was hashed over and a new date of May 18 set for a second attempt, with the object of smoothing out the rough spots. May 18 was beautiful, serving not only to gather operating experience but as a picnic affair for the XYLs and Joes. A third trial June 15 gave us additional familiarity with the equipment, but now the big day was at hand. The evening of June 27 we set up camp and got the wires up, and were fully ready when the first gear arrived at 0900 Saturday. By midmorning the tent was up, the genny placed and the power leads strung. One rig was on by noon and contacts were made to see that things were functioning. We entered the FD QRM making regular QSOs and as more fellows arrived with additional gear, the second xmtr became active, this allowing one rig to be on while the second stood by. All ops worked both phone and c.w., giving each an opportunity to learn where he could do the best. The hours ticked by with appalling swiftness until we reluctantly pulled the switches to finish our first real FD. A log check indicated an average of one contact each five minutes, short of the goal but long in experience gained. All felt the score could be substantially increased in a rerun. Although we had to take things down in a pouring rain, Field Day had proved our ability to set up and operate a station under emergency conditions. See you all next year!" — *Beaverton Mike & Key Club, W7ZLC/7.* . . . "Our station, licensed at the Des Moines County Civil Defense Training and Control Center, has access to city-owned c.d. equipment so our phone position employed their Valiant and SX-100 while c.w. used privately-owned gear. Most members are signed up for RACES and our plan is now being approved. A recently-acquired surplus USAF communications van served for our phone position with equipment temporarily installed. We intend to fix it up inside by installing operating tables, electrical wiring, antenna connections, etc. We also had a c.d. pick-up truck and a c.d. sedan at our disposal. The aurora display at 2300 ruined radio conditions and our score, but we bettered our 1957 effort by 75 contacts and got nice write-ups in the Burlington *Hawk-eye Gazette.*" — *Iowa-Illinois ARC, K0LDN/0.* . . . "Each rig was in a separate 15-foot trailer house, and the entire area was lighted with three 150-watt spotlights from the beam mast. A tent was available for sleeping. Gulf of Mexico provided swimming and bathing, and fish were caught two at a time from trailer door while operating. French and American coffee was served. One op got wet when the air mattress on which he was sleeping was washed into the Gulf at high tide at 4:20 A.M." — *Magic Valley RA, W5LKJ/5.* . . . "Good time, good wx, good beer, no luck!" — *Seymour ARC, W9DES/9.* . . . "This year I was to bring only 80, 40 and 20 meter folded dipoles and nothing else. At 1300 Saturday we arrived at the location near Hamilton, Ontario, and by 1400 were ready to hook up the skywires. Imagine my consternation when I realized I had left them home, 70 miles away. There was a bug, coax, gasoline, chairs, clothes, rubber boats, sleeping bag, blankets, food — everything but the antennas. Well, you have never seen a '54 Chevy move so fast. In 3¾ hours I was back with them. As an anticlimax they fell down twice before being successfully hung, so we didn't get going until 1800 hours. For this classic boner the gang bestowed on me the much despised 'Order of the Canary Brain.'" — *VE3FT/3 for Blackheath Cold Beer & Hot Bun Soc.* . . . "Most unusual experience was that there were no unusual experiences. Everything functioned smoothly for a change. First year we have used dipoles instead of long wires with amazing results. A 24-hour FD with just two ops is insane but we did it anyway." — *W3EMD/3.* . . . "Remember to take along a first-aid kit, pillows, bug repellent or spray, plenty of liquid refreshment, and enough gas to last the night. Gas stations, we discovered, aren't open at 4:00 A.M." — *W8SLR/8.* . . . "What is meant by '8kyoo skyoo (yawn) sykoo feelay'?" — *K7AAW.* . . . "Brother, what QRM! By the way, how about a special multiplier for the 2500 sandwiches and 32,000 cups of coffee W4CFA made? Must be *some* kind of record." — *Orlando RC, W4PLB/4.*

Radiomen at Albrook Air Force Base's KZ5AF/KZ5 wound up second in the three-transmitter class with 9078 points, biggest score ever made in Canal Zone. (U.S.A.F. photo)

SCORES

CLASS A

Class A stations are clubs and groups in the field. Scores are tabulated according to the number of transmitters operated simultaneously at each station. The figures and letters following each call indicate the number of valid contacts, the power inputs used, the number of participants

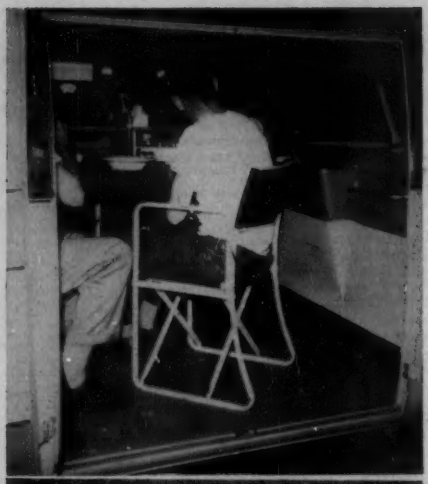
at each station and the final score. The "power classification" used in computing the score is indicated by the letters A, B or C after the number of QSOs shown. A indicates power up to and including 30 watts (multiplier of 3); B indicates power over 30, up to and including 150 watts (multiplier of 2); C indicates over 150 watts (multiplier of 1).

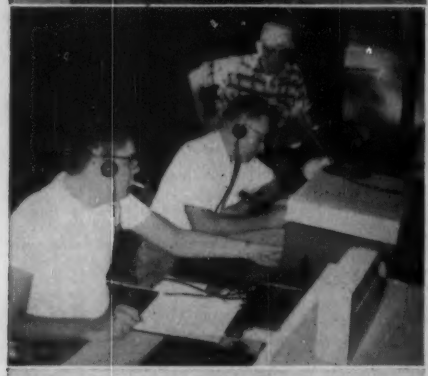
One Transmitter

W5EKK/5	Manaano Mt. Moonshine & Rhombic Soc.	685-	A- 8-	6534
KH6RS/KH6	Maui ARC	588-	A-20-	5517
WØDKI/Ø	American Red Cross of St. Paul	409-	A- 6-	3906
W6QFK/6	San Gabriel Valley RC	320-	A-30-	3105
W7OTV/7	Tualatin Valley ARC	421-	AB-24-	3027
K5GOI/5	Brasoria County ARC	464-	B- 7-	2940
KH6EN/KH6	Happy Hawaiians	326-	A-10-	2934
KH6LM/KH6	(noneiub group)	294-	A- 6-	2871
W5OIJ/5	Bayshore RC	317-	A-12-	2853
W8DJN/8	(noneiub group)	289-	A- 6-	2826
WØDEP/Ø	(noneiub group)	268-	A- 4-	2637
W4SUD/4	Owensboro ARC	436-	B-31-	2616
W5DDL/5	Lafayette ARC	404-	B-11-	2574
W6BLY/6	Whittier Radio 50 Club	245-	A-10-	2430
W7LHM/7	(noneiub group)	398-	B-10-	2388
WØANV/Ø	(noneiub group)	259-	A- 4-	2331
W6QWK/6	(noneiub group)	258-	A- 6-	2322
W3RVC/3	Allegheny-Kiski AR Assn	357-	B-17-	2292
W4ACA/4	Brevard RC	375-	B- 3-	2250
W9ONB/9	(noneiub group)	225-	A- 4-	2250
WØNWX/Ø	Newton RC	225-	A-12-	2250
W8FWQ/8	Brass Pounders ARC	213-	A- 6-	2142
W7LRA/7	Utah ARC	211-	A- 6-	2124
W8NCF/8	Tusco RC	210-	A-18-	2115
W4DIJ/4	(noneiub group)	209-	A- 4-	2106
W4LLO/4	Key West ARC	208-	A-10-	2097
W7YEY/7	(noneiub group)	208-	A- 4-	2097
K8APE/8	Massillon ARC	231-	A-11-	2079
WØIA/Ø	Boulder ARC	318-	B-15-	2055
W9YIT/9	(noneiub group)	315-	B- 3-	2040
W4EM/4	Mid-South AR Assn	312-	B-21-	2022
KH6AQL/KH6	Hilo ARC	199-	A-35-	2016
K4VLW/4	Old Dominion ARC	310-	B-13-	2010
W5UR8N/5	(noneiub group)	303-	B- 9-	1968
WØRET/Ø	(noneiub group)	280-	AB- 6-	1953
W6IFZ/6	Richmond RC	297-	B- 3-	1932
WØGHZ/Ø	Des Moines Tech High RC	292-	B-13-	1926
K4ICW/4	Albany ARC	286-	B-21-	1866
K6IUM/6	(noneiub group)	181-	A- 4-	1854
K5PEO/5	Tupelo ARC	278-	B-17-	1818
W8INS/8	Muskingum AR Assn	300-	B- 6-	1800
W8RTR/8	Canton ARC	173-	A-29-	1782
K2FQ/2	Niagara Frontier DX Assn	295-	B- 7-	1770
W7YK/7	Benson Polytechnic ARC	260-	B- 6-	1710
W9NZ/9	SWANI ARC	190-	A-10-	1710
VE3FT/3	Blackheath Cold Beer & Hot Bun Propagation Soc.	161-	A- 4-	1674
W5PIM/5	(noneiub group)	156-	A- 5-	1629
W7ZLC/7	Beaverton Mike & Key Club	271-	B-12-	1626
K9DVF/9	(noneiub group)	154-	A-11-	1611
W4VOZ/4	Winter Haven AR Assn	179-	AB- 8-	1587
W7JKB/7	(noneiub group)	239-	B- 7-	1584
W2NLQ/2	(noneiub group)	205-	AB- 3-	1581
W4DKT/4	(noneiub group)	261-	B- 5-	1566
W6KSW/6	(noneiub group)	235-	B- 3-	1566
W1CQO/1	Willimantic RC	237-	AB-12-	1551
W4ML/4	Tuscaloosa ARC	232-	B- 5-	1542
VE2EE/2	Canadair Ltd. ARC	144-	A- 5-	1539
K7AIA/7	Santiam RC	230-	B- 8-	1530
W9EPT/9	Michiana V.H.F. RC	144-	A-13-	1521
KØDGL/5	Harrison Emergency Communications Assn	225-	AB- 7-	1515
W2QW/2	Raritan Valley RC	142-	A- 4-	1503
K2SOL/2	(noneiub group)	248-	AB- 5-	1497
W5OVX/5	(noneiub group)	138-	A- 5-	1467
W4AB/4	Broward ARC	218-	B-20-	1458
W8VQI/8	Buckeye Shortwave Radio Assn	243-	B- 6-	1458
W6YR/6	Student Engineers RC	183-	AB- 7-	1455
W8MAI/8	Blossomland AR Assn	213-	B-10-	1434
K8BTP/8	Quaker Radio Assn	231-	B-16-	1398
W5NNI/5	Sabine Valley ARC	229-	B- 8-	1374
K5GHP/5	(noneiub group)	152-	A- 4-	1368
W4DPD/4	Lake Wales ARC	199-	B-19-	1344
W2APH/2	(noneiub group)	148-	A- 4-	1332
W2GSJ/2	RA of Greater Syracuse	175-	AB- 4-	1314
W7VPA/7	Richland ARC	219-	B- 8-	1314
W9CDO/9	ElectCtub	197-	ABC-12-	1311
W8SGT/8	Central Buckeye AR Assn	435-	C-11-	1305
WØIIK/Ø	Winona ARC	216-	B-12-	1296
K8CKU/8	(noneiub group)	143-	A- 6-	1287
W7IXH/7	Scottsdale ARC	179-	B- 5-	1224
W9JMN/9	Oconto County AR Assn	177-	B- 6-	1212
W2TIO/2	(noneiub group)	130-	A- 9-	1170
KØDEX/Ø	(noneiub group)	192-	B- 6-	1152
W7TRU/7	Harlo RC	162-	B- 8-	1134
W4WQT/4	Tenn-Tucky ARC	161-	AB- 8-	1122
K4KGR/4	Cheraw RA League	161-	B-10-	1122
K2BCI/2	Wantagh RC	99-	A-10-	1116
K8DXF/8	Mason County RC	186-	B-12-	1116
K9GBB/9	(noneiub group)	99-	A- 3-	1116
W8LT/8	Military & ARC of Ohio State Univ.	160-	AB- 7-	1113
W5DSZ/5	Caravan Club of Louisiana	159-	B-10-	1104
W7WUC/7	Catalina RC	157-	B- 6-	1092
W9DFV/9	(noneiub group)	157-	B- 5-	1092

Plenty of swimming, sunning and sailing between QSOs at W1BB/1, situated on the pier at the Winthrop (Mass.) Yacht Club.

K9LFO/9	(noneiub group)	95-	A- 3-	1080
W8SYX/8	Six Meter Nomads	179-	B-10-	1074
W2PET/2	(noneiub group)	132-	AB- 4-	1068
W7SO/7	Albany ARC	176-	B- 7-	1056
K7AUO/7	Tektronix Employees' ARC	174-	B- 9-	1044
W9MAK/9	(noneiub group)	149-	B- 7-	1044
W7SSF/7	Butte ARC	147-	B-15-	1032
KØITZ/Ø	Nodaway Valley R Assn	147-	B- 7-	1032
W4UHC/4	Ancient City ARC	145-	B- 9-	1020
W1OP/1	Providence R Assn	113-	A- -	1017
W3GH/3	Wyoming Valley ARC	88-	A- 8-	1017
VE1DX/1	Dartmouth ARC	98-	A- 6-	1017
W4BOW/4	Lakeland AR Soc.	241-	B-10-	1014
KØMMA/Ø	Sugar Creek ARC	167-	B- 7-	1002
K4SGI/4	Carroll County AREC	138-	B- 4-	978
W4NYK/4	Blue Ridge ARC	162-	B- -	972
W6GED/6	Firestone Band-Jammers RC	133-	B- 4-	960
K2ESU/2	Somerset Hills RC	81-	A- 4-	954
WØEDA/Ø	Rolla AR Assn	157-	B- 4-	942
WØYI/Ø	Campus RC	125-	AB- 5-	936
VE2JB/2	(noneiub group)	125-	B- 3-	912
K8JTC/8	North Canton ARC	100-	A- 7-	900
W3PGA/3	Aero ARC	149-	B- -	894
WØYVY/Ø	RC of Leavenworth Senior High School	148-	B- 8-	888
KØGDW/Ø	Kaw Blue RC	122-	B-18-	882
K8INN/8	Oshtemo Amat. Six Meter Club	94-	A- -	846
K5LRW/5	Alamogordo ARC	94-	A- 3-	846
W6MTW/6	(noneiub group)	140-	B- 6-	840
WØIO/Ø	State Univ. of Iowa ARC	140-	B- 9-	840
WØZWY/Ø	Sioux Falls ARC	140-	B-16-	840
K5NBD/5	Ruston RC	137-	B- 8-	822
K9HGX/9	Cenois AR Assn	137-	B-20-	822
W9ZTN/9	Allison ARC	134-	B-15-	804
W7ROX/7	Gallatin ARC	129-	B- 9-	774
W4OWV/4	(noneiub group)	101-	B- 4-	768
W8GMP/8	Mumford High School ARC	128-	B-13-	768
WØBMM/Ø	O.B.P. #1 ARC	127-	B- 4-	762
W3KYR/3	Boys' Club of St. Marys AR Soc.	81-	A- 4-	729
VE2CO/2	Lakeshore Field Day Group	56-	A- 3-	729
K2QDI/2	(noneiub group)	120-	B- 5-	720
W9NGI/9	Society R Operators	220-	AC-15-	720
W8VHY/8	(noneiub group)	119-	B- 3-	714
W8YKV/8	(noneiub group)	119-	B- 8-	714
W8ODJ/8	Buckeye Shortwave R Assn	113-	B-15-	678
W7RQQ/7	(noneiub group)	107-	B- 4-	642
K7AUV/7	(noneiub group)	107-	B- 4-	642
W9PSD/9	Richmond AR Assn	107-	B- 4-	642
W8SLR/8	(noneiub group)	209-	C- 7-	627
W9TBY/9	Neenah-Menasha ARC	104-	B-10-	624
KØEMR/Ø	Wapsie RC	79-	B- 9-	624
W3CDI/3	Baltimore Polytechnic Institute RC	103-	B- 5-	618
WØZSJ/Ø	Mitchell RAC	77-	B- 5-	612
W9LVC/9	TVI RC	101-	B- 6-	606
W3EXW/3	Etna RC	98-	B-11-	588
KØJOQ/Ø	Crete ARC	96-	B- 4-	576
W1FKJ/1	(noneiub group)	70-	B- 3-	570
W8TQK/8	Barry AR Assn	91-	B- -	546
KØGVG/Ø	Clinton ARC	157-	C-14-	546
W1SBF/1	Meriden ARC	54-	A-14-	486
W9QAB/9	Midway RC	53-	A- 4-	477
K8BXD/8	Fremont AR Communication Engineers	51-	A- 4-	459
W6NAD/6	(noneiub group)	74-	B- 4-	444
K9CUI/9	(noneiub group)	142-	C- 3-	426
W1FCE/1	(noneiub group)	69-	AB- 8-	414
K6VWF/6	(noneiub group)	49-	AB- 4-	393
W9LIF/9	Tri-State AR Soc.	65-	B- 5-	390
WØRRP/Ø	(noneiub group)	65-	B-10-	390
WØVLF/Ø	Story County AREC	37-	AB-10-	390





Left column, top to bottom: Hampton Roads Radio Club, K4UYT/4; Seneca Radio Club, W8ID/8; Johnson County Radio Amateur Club, WØLPA/Mobile; Cathay Amateur Radio Club, W6MFI/6. Right, top to bottom: W7JKB/7; W5YFN/5; Muskingum Amateur Radio Assn., W8INS/8.

Left column, top to bottom: Atlanta Teenage Radio Club, W4LG/4; Valley Radio Club, W8EPJ/8; Rock Creek Amateur Radio Assn., W3RCN/3. Right, top to bottom: El Segundo CD Radio Group, K6CUK/6; Nodaway Valley Radio Assn., KØITZ/Ø; Candlewood Amateur Radio Assn., W1VB/1; Oak Ridge Radio Operators Club, W4SKH/4.

All hands pitch in on the operating chores in first Field Day try of Wapsie Radio Club's KØEMR/Ø. (Photo by KØHLX)

K8GJW/8	Cleveland VHF RC	64-	B- 8-	384
W7FIO/7	Dallas ARC	63-	B- 5-	378
KØBDI/Ø	Lombard Six Meter Emergency Radio Corps	42-	A- 6-	378
WØVEM/Ø	Albert Lea Area Spider Web AR Assn	27-	AB- 8-	360
WØWER/Ø	Newton ARC	39-	A-12-	351
W2UMI/2	Oswego County AR Assn	58-	B- 6-	348
W8EQ/8	Lima Area ARC	58-	B-10-	348
W7MRW/7	Newberg ARC	56-	B- 8-	336
W7BCZ/7	Lower Yakima Valley RA	53-	B- -	318
K5BYA/5	(noneclub group)	52-	B- 7-	312
WØNQK/Ø	Fairmont RC	52-	B- 8-	312
W6QXF/6	Porterville ARC	50-	B- -	300
VE6PF/6	Southern Alberta ARC	48-	B-10-	288
K9CAH/9	(noneclub group)	42-	B- -	252
VE5MA/5	Moose Jaw ARC	40-	B- -	240
VE3DBT/3	(noneclub group)	25-	A- 3-	225
VE1IZ/1	(noneclub group)	00-	B-10-	222
W8SZF/8	Hillcrest YMCA Jr. RC	200-	B-12-	200
W4GQK/4	Cartersville ARC	33-	B- 3-	198
W9TGM/9	North Central Indiana ARC	85-	B-10-	170
KØKYD/Ø	(noneclub group)	24-	B- 3-	136
W1SAD/1	(noneclub group)	14-	A- 4-	126
K9DXB/9	Sullivan County RAC	41-	C- -	123
KN8ITD/8	(noneclub group)	19-	B- -	114
KN1DAI/1	Hampden County RA Novices	13-	AB- 3-	111
K8BFF/8	St. Joseph High RC	12-	A- 4-	108
K9EEC/9	(noneclub group)	15-	A- 5-	90
KN8HAS/8	(noneclub group)	9-	A- 7-	87
K4JFZ/4	(noneclub group)	38-	B- 3-	76
KN6RQM/6	Porterville ARC Novices	8-	A- 1-	72
KN5MHU/5	(noneclub group)	25-	B- 3-	50
W1COL/1	(noneclub group)	4-	A- 3-	36
K1HDZ/1	Witch City RC	4-	A- -	36
	Two Transmitters Operated Simultaneously			
K2FC/2	Order of Boiled Owls	700-	A-12-	6525
W3MFW/3	Elizabethtown Area Gang	593-	A-11-	5562
KP4WV/KP4	Ramey ARC	583-	A-18-	5472
K2KGB/2	Night Owl Net	577-	A-11-	5418
K6LDA/6	Crescent Bay Emergency Net	541-	A-21-	5094
W3ISE/3	(noneclub group)	507-	A-10-	4788
W2IQ/2	(noneclub group)	500-	A-10-	4725
W6JVA/6	Mike & Key Club	438-	A- 8-	4635
WØRFU/Ø	Bandhopper's RC	551-	AB-11-	4272
W9ERU/9	(noneclub group)	435-	A- 6-	4140
W5GQB/6	(noneclub group)	578-	AB- 4-	4077
W4MN/4	Palmetto RAC	614-	B-16-	3834
W2ODP/2	Irvington RAC	407-	A-32-	3663
K4UYT/4	Hampton Roads RC	596-	B-20-	3576
W1VB/1	Candlewood AR Assn	568-	B-16-	3558
W2COU/2	RA of Erie County	367-	A-12-	3528
WA6AHM/6	(noneclub group)	387-	A- 6-	3483
K4BMC/4	(noneclub group)	576-	B-16-	3456
K6KDE/6	(noneclub group)	474-	AB- 7-	3444
W4CVI/4	Suburban Colonels	568-	B- 7-	3408
W4ZV/4	Richmond ARC	567-	B-30-	3402
WØWWA/Ø	Prairie Village Teenage RC	413-	AB- 9-	3375
W3QJJ/3	Friendly AR Transmitters Soc	560-	B-10-	3360
K4PFN/4	Daytona Beach AR Assn	534-	B-12-	3354
K4OSQ/4	Miami Springs RC	522-	B-15-	3282
K5U8A/5	MAR8 Group	546-	B- 4-	3276
W6TO/6	Fresno ARC	513-	B-40-	3078
WØLGG/Ø	Central Iowa ARC	315-	A-10-	3069
W9REG/9	Tippecanoe AR Assn	464-	AB-12-	2994
W5N8/5	Bartlesville ARC	473-	B-30-	2988
W6SF/6	Stockton ARC	469-	B-12-	2964
KØJAD/Ø	Daniel Boone RC	385-	AB-15-	2940
W2ODY/2	Bayonne CD ARC	485-	B-15-	2910
KZ5JW/KZ5	Canal Zone AR Assn	466-	B-11-	2910
W5FQ/5	Meridian ARC	479-	B-15-	2874
W3MKA/3	West Phila. R Assn	416-	AB-20-	2826
W7VE/7	AR Assn of Bremerton	433-	B- 6-	2754
W1DZV/1	Royal Order of Left-Handed Chicken Pluckers	279-	A- 3-	2736
K4IVI/4	North Augusta-Belvedere RC	275-	A-14-	2700
KØLDN/Ø	Iowa-Illinois ARC	450-	B-22-	2700
W9AB/9	Michiana ARC	298-	A-11-	2682
W3YIW/3	(noneclub group)	382-	AB- 8-	2562
K8KLI/8	Kanawha RC	393-	B-25-	2520
W5UAO/5	Pittsburg County ARC	419-	B-11-	2514
W5KGJ/5	Fort Smith ARC	418-	B- 8-	2508
W5LKJ/5	Magic Valley RA	412-	B-15-	2472
W3BIP/3	The DX Club	407-	B- -	2442
W8ING/8	Ford AR League	405-	B-22-	2430
W9DKR/9	Kokomo ARC	308-	AB-20-	2412
K6TVQ/6	(noneclub group)	238-	A- 6-	2367
K2OML/2	Raritan Bay RA	347-	AB-12-	2340
K2VTL/2	Woodlawn RC	259-	A- 4-	2331
W7IO/7	Arizona ARC	381-	B-12-	2304
W8RYI/8	Kalamazoo ARC	223-	A-40-	2241
WØSIN/Ø	(noneclub group)	373-	B- 6-	2238
VE2CB/2	(noneclub group)	218-	A-13-	2205
K2BBR/2	Oceanside AR Soc	215-	A- 8-	2160
W9VT/9	Tri-Town ARC	435-	AB-31-	2157
W3QVW/3	Friendship ARC	249-	AB-25-	2154
W5EMF/5	(noneclub group)	226-	AB- 6-	2130
W5CCH/5	(noneclub group)	352-	B- 4-	2112
W3GAG/3	Philadelphia Wireless Assn	207-	A-10-	2097
K2KFJ/2	Cut-Throats RC	207-	A- 5-	2088
K5DLO/5	(noneclub group)	322-	B-10-	2082
K2CQG/2	Slide Mountain VHF Club	230-	A- 5-	2070
W9HRM/9	Milwaukee RAC	244-	AB-15-	2019
K6BUJ/6	(noneclub group)	313-	AB- -	2016
KØAPS/Ø	(noneclub group)	433-	BC-10-	1997
W4PLB/4	Orlando RC	325-	B- 9-	1950
W4OIX/4	Kinston AR Soc	318-	B- 9-	1908
KØDLE/Ø	Jayhawk AR Soc	308-	AB-20-	1857
W9ZSK/9	Martinsville ARC	181-	A-15-	1854
W4KEK/4	Peninsula ARC	281-	B-25-	1848
W9QWI/9	Ind. Mich. and Ohio VHF Club & Northeastern Ind. RC	283-	B-22-	1848
W1LAS/1	Waterbury ARC	381-	AC-18-	1833
W3PSH/3	Keystone ARC	208-	AB- 6-	1830
W2THO/2	Walton Ham Group	203-	A- 6-	1827
W3FGR/3	Dit Happy Dash Hounds	304-	B-10-	1824
K6KGK/6	Pleasant Valley ARC	178-	B- 7-	1818
W9PSL/9	(noneclub groups)	271-	B- 8-	1776
W8DPG/8	Forest City RC	259-	AB-12-	1767
W5DNE/5	Channel Communications Club	291-	B-14-	1746
WØMOU/Ø	(noneclub group)	263-	B- 8-	1740
K5GRG/5	Lake Charles High School	264-	B- 3-	1734
W3DVB/3	Short Skip RC	285-	B-10-	1716
W4KX/4	Rappahannock Valley RC	255-	B-10-	1710
W4DXI/4	(noneclub group)	259-	B- 3-	1704
W4UN/4	Jackson RC	197-	AB-20-	1701
W3BZF/3	Horseshoe RC	282-	B-18-	1692
K2KIR/2	(noneclub group)	254-	B- 5-	1668
W8OAJ/3	Mercer County R Assn	161-	A-25-	1674
W2QH/2	Greene ARC	278-	B- 6-	1668
K9NRN/9	(noneclub group)	159-	A- 3-	1656
K4FEF/4	MacDill MARS Club	516-	C-30-	1623
W1WTB/1	Milford ARC	269-	B-14-	1614
W6BDE/6	YLs of San Francisco	211-	AB- 7-	1572
K8AXF/8	Butler County VHF Assn	147-	A-14-	1566
WØUNT/Ø	Lawrence ARC	254-	AB-11-	1551
W1IKG/1	(noneclub group)	172-	AB- 3-	1542
W5BTU/5	Andrews County ARC	232-	B- 7-	1542
W4CN/4	AR Transmitting Soc	229-	B-25-	1524
W2JC/2	Bloomfield RC	169-	A- 8-	1521
W6HDO/6	Raysan RC	166-	AB-11-	1491
W8VTD/8	Warren AR Assn	248-	B- 8-	1488
W9AIQ/9	Door County ARC	222-	B- 7-	1482
W4IE/4	Sarasota AR Assn	221-	B-11-	1476
W7YN/7	Nevada AR Assn	242-	B-13-	1452
K5QHI/5	Women Ham Operators of Texas	215-	B- 9-	1440
W9VTI/9	(noneclub group)	159-	A- 3-	1431
W3GUR/3	Pottstown AR Assn	236-	B- -	1416
W6ASV/6	Tulare County ARC	236-	B-10-	1416
W4KC/4	Fort Myers ARC	206-	B- 6-	1392
W3ZWZ/3	North Pittsburgh Brass Pounders & Gum Beaters	163-	AB- 5-	1353
K4AA/4	Hialeah ARC	198-	AB-12-	1353
W4BFB/4	Mecklenburg AR Soc	224-	B- -	1334
W4HHO/4	Charleston ARC	196-	B- 7-	1326
W8VPV/8	Cuyahoga Falls RC	221-	B-18-	1326
K5LZW/5	Women Ham Operators of Tarrant County	194-	B- 7-	1320
W8LTZ/8	Grattot County AR Assn	194-	B-20-	1314
W3NAV/3	Coke Center RC	191-	B- 5-	1296
K3ERL/3	Mobile Sixers RC	180-	AB-15-	1293
W9UDU/9	Racine Megacycle Club	190-	B-25-	1290
VE3CKV/3	Algoma ARC	188-	B- 8-	1278
W1ECV/1	Southington AR Assn	196-	AB-12-	1227
W1HGE/1	(noneclub group)	136-	A-14-	1224
K9CDI/9	Albany Park ARC	172-	B- 6-	1182
K7CCH/7	Coos County RC	171-	B-12-	1176
W9OUS/9	Kankakee Area R Soc	195-	B- 9-	1170
K5JGN/5	Jasper High School RC	129-	A- 8-	1161
W3DJL/3	(noneclub group)	166-	AB- 4-	1152
K5PXP/5	Arkansas Valley ARC	166-	B- 6-	1146
W5KMK/5	Galveston County ARC	187-	B-20-	1122
VE7SE/7	The Thirteen ARC	162-	B- 9-	1122
W6CUS/6	East Bay ARC	98-	A- 6-	1107
K6ER/6	Sacramento ARC	90-	A-11-	1101
W8NZ/8	Calhoun Area RC	240-	BC-25-	1101
W8ZHO/8	Muskegon Area AR Council	367-	C-30-	1101
KØBPR/Ø	Fairfield High School ARC	182-	B-18-	1092
K3AGX/3	Oxford Circle RC	163-	B-10-	1080
K5ISY/5	Cenis ARC	178-	B- 3-	1068
VE7ASM/7	Fraser Valley ARC	130-	AB-10-	1062

W9OYR/9	Manorcad RC	149-	B- 7-	1056
K3CSF/3	Regular Fellows ARC	174-	B- 8-	1044
K9CAB/9	Glenbrook High School Electronics Club	90-	A- 7-	1035
K3AAF/3	(noniclub group)	147-	B- 5-	1032
W9UOX/9	Redwood Falls ARC	314-	C-20-	1020
W5ABF/5	Mineral Wells ARC	144-	A-12-	1014
W2SV/2	Sunrise RC	122-	AB-14-	993
K2YNT/2	Metuchen Y RC	89-	AB-10-	991
W9IQW/9	Rochester ARC	137-	B-28-	984
VE1IM/1	(noniclub group)	134-	B- 9-	954
W2ZRX/VO1	Pepperrell ARC	131-	B-15-	942
VE3HCD/3	Sarnia Civil Defense	157-	B- 5-	942
K4DXZ/4	Valley ARC	76-	A- 4-	909
W5IYN/5	Tyler ARC	126-	B-20-	906
K5JZZ/5	(noniclub group)	151-	B- 5-	906
W9CF8/9	Point RA	112-	AB-15-	855
K4JRU/4	Warner Robins ARC	141-	B- 7-	846
W3VV/3	McKean County RC	140-	B-12-	840
W5KS/8	(noniclub group)	92-	A- 4-	828
W1FYF/1	Wethersfield High School ARC	110-	AB- 3-	822
K4OFZ/4	Edisto ARC	135-	B- 5-	810
K2YKV/2	Melody Hill ARC	59-	A- 5-	801
K6QEZ/6	Sequoia ARC	107-	B- 9-	792
VE2APX/2	St. Johns RC	84-	A- -	756
W5PHP/5	Mt. Pleasant ARC	96-	B-11-	738
K8ASM/8	(noniclub group)	56-	A- 5-	729
K2BJP/2	(noniclub group)	118-	B- 5-	714
K5NCP/5	USNR Electronics Facility	180-	BC- -	714
K2ZOG/2	Putnam County AR Assn.	116-	B- 6-	696
W3ZRB/3	Clearfield County RC	113-	B- 5-	678
W9ERH/9	Johnson County RAC	86-	AB-10-	672
W3CYU/3	Warren County Emergency R Assn. & Corry RC	111-	B-12-	666
W9AML/9	Central Illinois RC	197-	BC-27-	657
VE3SCD/3	Stratford ARC	87-	AB- 8-	657
W1EH/1	South Lyme Beer, Chowder & Propagation Soc.	624-	C- 9-	649
W9TWM/9	Kishwaukee RC	194-	BC-13-	624
K9GUY/9	(noniclub group)	77-	B- 4-	612
K2DUR/2	Fulton ARC	96-	A- 7-	594
K9EAI/9	Grant County RC	54-	AB- 4-	576
W7GJQ/7	(noniclub group)	124-	A- 4-	450
W3CVE/3	District Heights RC	54-	AB- 9-	441
K2VSR/2	Troy High ARC	51-	AB- 3-	426
W8NC/8	Sandusky Valley ARC	69-	B- -	414
K8DAA/8	Holland Area RC	44-	B-12-	414
VE8QE/6	Central Alberta Radio League	69-	B- -	414
K2E8M/2	(noniclub group)	66-	B- 5-	396
VE3BEO/3	Kingston ARC	49-	AB-15-	327
W8ZJJ/8	Richmond ARC	42-	AB- 6-	321
W7UAK/7	Shoshone County ARC	35-	A- 6-	315
K9CIU/9	Homeleader RC	50-	B- 8-	300
K1DJH/1	Windhams RC	31-	A- 5-	279
W4NUN/4	Tarmetto ARC	135-	B- 4-	270
VE6TP/6	(noniclub group)	43-	AB- 3-	267
K4YHB/4	Naples ARC	152-	BC- 7-	252
W2WNA/2	Pelham Bay RC	35-	B- 3-	210
K3CEZ/3	Greenville AR Assn.	34-	B- 5-	204
W2ZJ/2	Elmira AR Assn.	92-	A-18-	184
W9CVJ/9	Tube & Shutter Club	26-	B-10-	156
W1WQM/1	Port City ARC	21-	AB-12-	147
W8DVA/8	Geneva AR Assn.	16-	A- 5-	144
K9NBK/9	Naf ARC	10-	B- 3-	60
K9EOH/9	Owen County ARC	1-	B- 4-	6
	Three Transmitters Operated Simultaneously			
W4FU/8	Ohio Valley AR Assn.	1081-	A-15-	9954
KZ5AF/KZ5	(noniclub group)	1215-	AB-18-	9078
W8MHM/6	Bell Gardens AR Assn.	810-	A-16-	7515
W1EIA/1	Connecticut Wireless Assn.	843-	AB-18-	7506
W6NWG/6	Palomar RC	775-	A- -	6975
W3TYU/3	Northeast RC	999-	AB-21-	6849
W8CZM/8	West Park Radiops	966-	AB-39-	6645
W3NKF/3	Naval Research Lab. ARC	707-	A-11-	6588
W4NVU/4	Dade RC	627-	A-20-	5904
W6JU/6	Crescenta Valley RC	619-	A-27-	5805
W2MO/2	Livingston ARC	717-	AB-15-	5766
W6KA/6	Pasadena RC	610-	A-16-	5715
W3OK/3	Delaware-Lehigh ARC	624-	A- -	5616
K6QEH/6	Hughes ARC	594-	A-18-	5571
K6CIZ/6	Aerojet RAC	668-	AB-30-	5250
W5KC/5	Baton Rouge RAC	575-	A-14-	5175
W2UBW/2	Mid-Island RC	543-	A-15-	5130
W3RDM/3	York Road RC	539-	A-20-	5076
W4SKH/4	Oak Ridge R Ops. Club	824-	B-40-	4944
W5IJO/5	(noniclub group)	590-	AB- 8-	4731
W8IJK/6	Aerojet ARC	701-	AB-16-	4731
W4PAY/4	ARC of Falls Church	527-	AB-20-	4629
W9AA/9	Hamfesters RC	624-	AB-12-	4509
W3ATR/3	Beacon RA	703-	AB-11-	4446
W1DMI/1	El Ray ARC	533-	AB-12-	4359
W2QYV/2	Niagara RC	451-	A-20-	4322
W4UNE/4	Greensboro RC	711-	B- -	4266
W1DDD/1	Blackstone Valley ARC	553-	AB-13-	4162
W5GU/5	Oklahoma City ARC	643-	AB-20-	4164
K6CXI/6	Alexander Hamilton High School RC	459-	A-14-	4131
K4GDL/4	Mike & Key Club	600-	AB-10-	4128
W7REP/7	Skagit ARC	433-	A- 8-	4122
K6YLL/6	RA Mobile Soc.	630-	B-19-	4110
K2KCE/2	Lockport AR Assn.	449-	AB-30-	4053
W4CVY/4	Columbus ARC	650-	B-31-	4050
W4TRC/4	Kingsport ARC	624-	B-29-	3900
W5KHB/5	Old Natchez ARC	591-	AB-15-	3870
W5MUZ/5	Ouachita Valley ARC	400-	A-15-	3825
K4JVA/4	South Miami RC	602-	B-22-	3792
W4NEK/4	Naval Air ARC	601-	AB-12-	3765
W5YM/5	ARC of the Univ. of Arkansas	627-	B-15-	3762
K6BRZ/6	Collins ARC	385-	A- 4-	3762
W2GLQ/2	Nutley ARC	377-	A-20-	3618
W2GLO/2	Levittown ARC	543-	AB-23-	3603
W8SNK/6	Bay Cities ARC & Santa Monica City College RC	373-	A-15-	3582
W2GBY/2	(noniclub group)	368-	A- 5-	3537
K5BJU/5	Gulf Area YL AR Klub	559-	B-10-	3504
K4HEX/4	Lynchburg ARC	583-	B-36-	3498
W4MEG/4	Kyana RC	551-	B-35-	3456
W8MAX/8	Lorain County AR Assn	514-	AB-15-	3402
VE7ARV/7	Vancouver ARC	478-	AB-13-	3375
W5PDO/5	Los Alamos ARC	457-	AB-12-	3366
W9SWP/9	(noniclub group)	391-	AB- 7-	3360
W5TSV/5	Pampa ARC	481-	AB-15-	3303
W6DWG/6	Sylvania ARC	342-	A-20-	3303
W7NTO/7	Lewis County ARC	340-	A-15-	3285
W5PAA/5	Aeronautical Center ARC	489-	AB-40-	3222
K9ATM/9	Chilburban R Mobileers	519-	AB- 4-	3222
W5TAK/5	Jackson ARC	412-	AB-18-	3159
W6LZ/6	Poinsettia RC	467-	AB-19-	3063
K7AAH/7	McChord ARC	442-	AB-10-	3063
W2PPY/2	R Assn. of Western N.Y.	474-	AB-25-	3060
W9ERG/9	Sioux City ARC	476-	AB-14-	3060
W3WJD/3	Delco RC	489-	B- 6-	2934
W8NCM/8	Springfield ARC	286-	A-22-	2817
W4CB/4	Danville ARC	377-	AB-10-	2763
W3VPR/3	Anne Arundel RC	388-	AB- 9-	2706
W5CBW/5	Two Meter MARS Club	364-	AB-13-	2637
W5FC/5	Dallas ARC	401-	B-30-	2562
K6JDL/6	Mojave Desert ARC	259-	A- 9-	2556
K9WBT/9	Ft. Sheridan ARC	336-	AB-45-	2523
W1JFK/1	Tri-City AR Counell	366-	AB- 8-	2451
K4JIY/4	Aiken ARC	317-	AB-16-	2433
W6UJ/6	(noniclub group)	284-	AB- 4-	2403
W9VWJ/9	Montgomery County AREC	374-	B- 6-	2394
K4WBG/4	(noniclub group)	369-	B- -	2376
W9MSG/9	Chicago R Traffic Assn.	233-	A- 9-	2322
K5ISK/5	Oklahoma A. & M Tech. AR Assn.	356-	B- 3-	2310
W6CBH/6	BB Brain RC	254-	A-12-	2286
W1BRF/1	Quinebaug Valley RC	328-	AB-12-	2259
W3NA/3	(noniclub group)	297-	AB- 5-	2247
K2LAK/2	South Side RC	303-	AB-15-	2232
K2ADS/2	Rockaway Valley RC	293-	AB-42-	2214
W9CAF/9	Chicago ARC	249-	AB-15-	2157
W5HTK/5	Enid ARC	358-	B-16-	2148
W4GAC/4	St. Petersburg ARC	356-	B-40-	2136
W1VXL/1	Cranston AR Assn.	260-	AB-18-	2115
K1COV/1	(noniclub group)	229-	A- -	2061
K2TAZ/2	Northern Nassau ARC	288-	AB-15-	2046
K2SW1/2	(noniclub group)	260-	AB- 5-	2031
K8EIJ/8	Wayne County ARC	246-	AB-10-	2013
W1JT/1	East Providence AR Assn.	302-	B-10-	2010
K2LSA/2	State Line RC	222-	A-15-	1998
W8MMI/8	Niles ARC	329-	B-14-	1974
W2MAU/2	Syracuse VHF Club	288-	AB- 7-	1944
W1EUH/1	Pinhead Net	314-	B-11-	1884
K4ALI/4	Pensacola ARC	314-	B-15-	1884
K6EMN/6	Pan American RC	238-	AB- 9-	1872
W3RSC/3	Allband R Klub	266-	AB- 7-	1845
W6MIX/6	El Dorado County ARC	279-	AB-12-	1845
W6MLK/6	High Frequency Amateur Mobile Soc.	290-	AB- 7-	1836
W9MJL/9	Vermilion County AR Assn.	302-	B-20-	1812
W2MBC/2	Delaware Township High School RC	229-	AB- 9-	1809
W8RLT/8	Livonia RC	258-	AB-30-	1803
K2RKO/2	Livingston High School RC	199-	A- -	1791
W8AM/8	Coffee Dunkers of Detroit	272-	B-10-	1782
K5LRU/5	Muskogee ARC	564-	BC-28-	1766
W7NBR/7	Spokane RA	266-	B-17-	1746
W6SD/6	San Fernando Valley RC	241-	AB-20-	1743
K9CQA/9	Hoosier Hills Ham Club	246-	AB-18-	1740
W5ES/5	El Paso ARC	288-	B-25-	1728
W8QO/8	Tecumseh ARC	288-	B- -	1728

Halifax Amateur Radio Club, VE1FO/1 (VE1IF keying)

Chicago Suburban Radio Assn., W9SW/9

W2BVL/2	Nassau RC	246-	AB- 8-	1722
W8CRR/8	Scioto Valley ARC	260-	B-20-	1710
W0FLN/9	St. Louis University ARC	259-	B- 7-	1704
W5IU/5	Kerrville RC	279-	AB-12-	1701
W8ACW/8	Genesee County RC	283-	B- -	1698
W1NBN/1	Merrimack Valley ARC	212-	AB- -	1644
KP4FAE/KP4	Air Force ROTC ARC	266-	B-16-	1596
VE1FO/1	Halifax ARC	150-	A-14-	1593
W0IWE/0	Black Hills ARC	150-	A-22-	1575
W1HEB/1	Middlesex ARC	217-	AB-11-	1566
W5QA/5	Abilene ARC	260-	B-21-	1560
W0PMW/0	Boot Hill ARC	230-	B-15-	1530
W0BGG/0	Pioneer RC	194-	AB-18-	1518
W7SUI/7	(noclub group)	227-	B- 7-	1512
W8QIH/8	Walnut Hills High School RC	179-	AC- 4-	1482
K4YTZ/4	Rock Hills ARC	202-	A- -	1461
K6HS/6	(noclub group)	137-	A- 3-	1458
W1LAM/1	Bristol County R Assn.	226-	AB-18-	1446
K2GRE/2	Glen Cove RC	160-	A-12-	1440
W8WXN/8	Detroit Metropolitan RC	198-	AB-10-	1437
W7ETO/7	Apple City RC	214-	B-12-	1434
W1BY/1	(noclub group)	229-	AB- 4-	1419
W3FZC/3	MIC ARC	220-	AC-11-	1410
W1BB/1	Winthrop Emergency R Net	165-	AB-20-	1383
K0CTT/0	Air Capitol AR Assn.	230-	B-20-	1380
W9GFD/9	Prairie ARC	212-	AB-20-	1374
VE3DC/3	Hamilton ARC	206-	B-16-	1236
W5ABB/5	Del Rio ARC	201-	B- 8-	1356
W2SEX/2	AR Assn. of the Tonawandas	200-	B-20-	1350
W1YFA/1	Walpole AR Assn.	122-	A- 3-	1323
K2MYY/2	Rahway High School RC	168-	AB-15-	1305
W2HIP/2	Mid-Hudson RC	166-	AB- 7-	1299
K4JGQ/4	(noclub group)	215-	B- 3-	1290
K0DLS/0	(noclub group)	213-	B- -	1278
VE3SRC/3	Scarborough ARC	166-	AB-11-	1269
K8EEN/8	Mt. Vernon ARC	210-	B- 5-	1260
VE3YJ/3	London ARC	133-	AB-10-	1242
W7HMK/7	Central Oregon RA	171-	AB-11-	1224
K0GPV/0	Southwest Iowa AR Assn.	175-	B-16-	1200
W9JIY/9	Central Indiana Mobile RC	172-	B-15-	1182
W6KJF/6	Far West RC	171-	B- 8-	1176
K2KED/2	Burlington County RC	182-	AB-10-	1173
W6BML/6	Mt. Shasta ARC	194-	B-12-	1164
K9APM/9	Wheaton Community RA	168-	B-11-	1158
W4SB/4	Tidewater Mobile RC	297-	ABC-16-	1146
VE2ADX/2	South Shore ARC	168-	AB-12-	1143
K3CSG/3	Abington ARC	120-	A- -	1080
W7TZ/7	Grays Harbor ARC	154-	B-16-	1074
W9IKY/9	Green Bay Mike & Key Club	167-	AB-17-	1059
VE7BQ/7	Totem ARC	152-	AB- 4-	1044
K0HLA/0	(noclub group)	114-	A- 4-	1026
W2EB/2	Squaw Island ARC	113-	A-10-	1017
W4BKT/4	Tri-County ARC	167-	B- 9-	1002
W9EJC/9	Miami County RC	153-	AB-14-	990
W0UAN/0	(noclub group)	109-	A- 4-	981
K3DBE/3	Aliquippa Area RA Assn	154-	B-12-	924
W0DRC/0	Tri-State R Soc.	151-	B- 9-	906
K1HOA/1	Reading & Woburn RC	100-	A- 7-	900
K9JKL/9	WANE Television Gang	173-	AB- 4-	846
W7ECA/7	Electric City RC	279-	C-12-	837
W3ZIC/3	Fort Venango Mike & Key Club	136-	B-15-	816
W8EPJ/8	Valley RC	111-	AB- 6-	807
W8FY/8	Van Wert ARC	128-	B- -	768
W7OEK/7	Rogue Valley ARC	101-	AB- 8-	762
W2IQT/2	(noclub group)	83-	A- 6-	747
W9BOM/9	Kenosha R Communications Soc.	124-	B-12-	744
K0IIK/0	Three Rivers ARC	122-	B-12-	732
VE7WO/7	Point Grey ARC	97-	B- 7-	732
W5HPI/5	Terry County ARC	121-	B-16-	726
K2YOU/2	Ulster County Mike & Key Club	85-	AB-20-	675
W1SGZ/1	Norwalk AREC	112-	ABC- 6-	669
K1BOS/1	Southwick CD Radio Group	74-	A- 5-	666
W2DAY/2	Northern New Jersey Radio Assn.	47-	A-10-	648
K9HDH/9	Elkhart ARC	83-	ABC-11-	630
K4IMA/4	Walnut Hill ARC	230-	AB- 4-	627
K2IBC/2	Avenel RC	101-	B- 6-	606
W0TWU/0	McPherson ARC	138-	ABC- 3-	558
K0AXU/0	Northwest St. Louis ARC	241-	B-16-	532
K6KHZ/6	Tehama County ARC	88-	B- 9-	528
W3FT/3	Baltimore ARC	83-	AB-14-	522
W1ZLH/1	Middlebury Mike & Key Club	121-	AB- -	519
W0ZOU/0	Blue Valley RC	86-	B- 7-	516
K8DDD/8	Detroit Mike & Key Club	82-	B-15-	492
W1VTJ/1	(noclub group)	73-	AB- 7-	483
K1AET/1	(noclub group)	76-	B- 5-	456
K2VKZ/2	Marathon ARC	26-	AB-15-	456
W5ICE/4	(noclub group)	50-	B- 6-	450
W3HZW/3	Kent County ARC	132-	BC-14-	441
W9DES/9	Seymour AMC	218-	B-13-	436
VE2CQ/2	RC of Quebec	110-	A-14-	405
W0EGG/0	Hastings ARC	41-	B- 6-	396
W0WFD/0	Coffeyville ARC	66-	B-10-	396
W3DUL/3	Hazleton ARC	49-	AB-10-	369
W2CWR/2	Amateur VHF Institute of N. Y.	151-	AB-10-	345
K0HND/0	Windom AR Soc.	54-	B-14-	324
W2BMW/3	Tu-Boro RC	82-	A-15-	321
KN9IZK/9	(noclub group)	23-	B- 6-	288
W6NIK/6	Tuolumne AR Soc.	36-	AB- 4-	258
K9ELE/9	Winslow AR Soc.	92-	B- 5-	234
VE2UB/2	St. Maurice Valley AR Assn.	39-	B-12-	234
WA2AHY/2	Central Queens RC	27-	AB-16-	210
W0REA/0	St. Paul Mobile RC	28-	AB- 6-	195
K8ESE/8	(noclub group)	26-	B- 8-	156

Four Transmitters Operated Simultaneously

W2OYH/2	Morris RC	1199-	A-21-	11,061
W2OR/2	Pompton Valley RC	1133-	AB-50-	10,212
W9PC8/9	York RC	922-	A-10-	8523
W6JNT/6	Citrus Belt ARC	931-	A-15-	8379
K6ACF/6	Rio Hondo RC	777-	AB-22-	6411
W2CWW/2	Staten Island AR Assn.	744-	AB-15-	6372
W6LRT/6	North Bay AR Assn.	804-	AB-14-	5997
W3NEW/3	Capitol Suburban RC	901-	B-15-	5556
W2OIC/2	Larkfield ARC	776-	AB-25-	5412
K6LTA/6	Beachwood AR Klub	556-	A- 6-	5229
W7AW/7	West Seattle ARC	744-	B-20-	4638
K2PQL/2	Bethpage ARC	665-	AB-20-	4485
W8TO/8	Columbus AR Assn.	632-	AB-29-	4017
W4THM/4	Bristol ARC	591-	AB- 7-	4008
W3JNQ/3	Frankford RC	1063-	BC-17-	3978
W6AEX/6	Soc. of AR Operators	440-	A-32-	3960
K6NIR/6	Ramona RC	544-	AB-28-	3792
W4HCB/4	(noclub group)	590-	B-17-	3744
W1KKS/1	Manchester RC	382-	AB-42-	3507
W4HFH/4	Alexandria RC	549-	AB-15-	3480
K6CUK/6	El Segundo CD Radio Group	475-	AB-15-	3459
W3KOU/3	(noclub group)	382-	AB-25-	3339
W1SYE/1	Newport County RC	534-	B-22-	3204
W5MS/5	Corpus Christi ARC	412-	ABC-18-	3135
W4YKY/4	Lake AR Assn.	397-	AB-38-	3069
W3AD/3	Lancaster R Transmitting Soc.	329-	AB-30-	3066
W7RGL/7	North Kitsap ARC	365-	AB-10-	3021
W6MZL/6	Cathay ARC	393-	AB- 7-	2910
K0KL/0	Kansas City ARC	484-	B-25-	2904
K8IIV/6	Southern California VHF RC	297-	A- 8-	2898
W9DUP/9	DuPage RC	286-	A-12-	2808
VE3AI8/3	Oakville ARC	279-	A-15-	2736
W1OSA/1	Pittsfield RC	443-	B-20-	2652
K9AVO/9	Western Electric ARC	446-	AB-17-	2625
K2MQW/2	Five Towns RC	410-	AB-17-	2592
W4LG/4	Atlanta Teenage RC	527-	BC-35-	2505
K0LIR/0	St. Louis ARC	389-	AB-17-	2433
W3ZEK/3	Harrisburg RAC	403-	B-44-	2418
W4MQN/4	Atlanta RC	334-	AB-16-	2277
VE1AEP/1	Sydney ARC	225-	A-12-	2250
W6VEJ/6	Sonoma County RAC	249-	A-10-	2241
W0OUI/0	Denver RC	307-	AB-10-	2193
W8AW/8	Edison RA Assn.	319-	AB-12-	2124
VE3B8Q/3	Quinte ARC	329-	AB-18-	2109
W9LCA/9	Chicagoland Mobile RC	292-	AB- 8-	2085
W4EFR/4	Petersburg ARC	313-	B-20-	2028
W4NEP/4	Paducah ARC	314-	AB-25-	1950
W8TZO/8	Glass City VHF Club	296-	AB- 9-	1935
W1GDH/1	Eastern Connecticut AR Assn.	305-	AB-12-	1896
W8SZN/8	20/9 RC	266-	B- 8-	1746
W8DC/8	Grand Rapids AR Assn.	284-	B- -	1704
W9ARA/9	Bloomington ARC	262-	B-23-	1572
W6UCS/6	Monterey Bay RC	301-	AB-10-	1556
K9CJU/9	RA Megacycle Soc.	229-	B-16-	1530
W3LLR/3	Pocono AR Klub	200-	AB-17-	1488
W4BTI/4	Kennehoochee ARC	246-	ABC-11-	1386
W4HBB/4	Savannah ARC	218-	B-15-	1308
W3SAY/3	Nittany Valley ARC	212-	AB-10-	1284
W4LEX/4	Decatur ARC	167-	B-20-	1272
W6ALL/6	Tuolumne AR Soc.	206-	B-18-	1248
K2ODT/2	(noclub group)	189-	AB- 9-	1245
K6QYF/6	San Gorgonio Pass ARC	151-	AB-15-	1239
W1MB/1	Satuit ARC	159-	AB-14-	1233
W4MIK/4	Prince William County AREC	254-	BC- 6-	1221
W9UC/9	Fort Wayne RC	196-	B-12-	1194
W7LAB/7	Ogden ARC	172-	B-37-	1182
W1CLO/1	Podunk ARC	181-	AB-15-	1158
W1HQH/1	Cape Cod & Islands AR Assn.	174-	AB-21-	1149
VE1PF/1	St. Croix Valley RC	94-	A-10-	1134
K9ENM/9	Pontiac RC	132-	AB-26-	1086
W8FO/8	Toledo RC	180-	B-40-	1080

K6ENK/6	Camellia Capital Chirps	168-	B- 7-	1008
K9GVL/9	Shelby County RC	166-	B-15-	996
K8DAC/8	Saginaw Valley AR Assn.	163-	B-10-	978
K1WA8/1	Northeastern Univ. MARS Club	146-	ABC- 7-	924
W6RHC/6	Golden Empire AR Soc.	103-	AB-10-	912
W2SZ/2	RPI RC	185-	ABC-16-	858
WØZRT/Ø	Central Dakota R Assn.	143-	B-13-	858
W8NAE/8	Thumb ARC	127-	B-10-	762
K2BKO/2	(noneclub group)	118-	B- 9-	708
K2DIE/2	Cowanesque Canisteo AR Assn.	93-	AB-11-	645
W8SDW/8	Wood County ARC	90-	B- 8-	540
K5PPZ/5	Alamo Heights ARC	74-	A-10-	444
WØIBB/Ø	(noneclub group)	81-	BC- 7-	399
W3CTG/3	Morristown High School ARC	62-	B- 8-	372

Five Transmitters Operated Simultaneously

K6BAG/6	Pacifico RC	1298-	AB-10-	11,823
K6BF/6	Santa Barbara ARC	1211-	A-19-	11,124
W6PML/6	United RAC	1153-	AB-20-	8754
W2YKQ/2	Lake Success RC	976-	AB-22-	8298
W3BTN/3	North Penn ARC	892-	AB-30-	5769
W6CX/6	Mt. Diablo ARC	614-	A-26-	5769
K8AIR/8	Wright-Patter on Communicators Club	903-	AB-35-	5850
K6IL/6	Newport AR i oc.	555-	A-52-	5220
K9AVE/9	Illinois Valley R Assn.	542-	A-20-	5130
W6ULI/6	Fullerton RC	659-	AB-12-	5106
W1SKT/1	Narragansett Assn. of Radio Operators	624-	AB-35-	4767
K6CVF/6	Bandspanners ARC	648-	AB-14-	4593
W5ABD/5	Westside ARC	705-	B-16-	4380
K2MKV/2	Paterson CD Emergency Group	606-	B-15-	4176
W7YYE/7	Oregonian AR Soc.	609-	B-10-	4164
K1GAY/1	Bedford RC	565-	AB-15-	3906
K8FAV/6	McClellan AR Soc.	491-	AB-20-	3834
K5AXA/5	San Angelo ARC	526-	AB-20-	3822
W2ZQ/2	Delaware Valley R Assn.	554-	AB-32-	3789
K6OWL/6	North Hills RC	576-	AB-19-	3756
VE3JJ/3	West Side RC of Toronto	375-	A-18-	3600
W6DGO/6	Imperial Beach RC	538-	AB- 6-	3525
KØIIT/Ø	Montrose County ARC	350-	A-17-	3150
W4VTA/4	Confederate Signal Corps	485-	B-10-	3072
W1SEA/1	Wilmington CD RC	419-	ABC-14-	3051
W3RQZ/3	Philmont Mobile RC	431-	AB-25-	2988
W3IIC/3	Cumberland Valley ARC	390-	AB- 5-	2961
K5QHD/5	Garland ARC	453-	B-15-	2868
W1UFKA/2	Stamford ARC	428-	AB-21-	2865
K5OCT/5	Santa Fe RC	389-	B-11-	2484
VE7EZ/7	Victoria Short Wave Club	384-	B-32-	2454
K6CKQ/6	Mt. View ARC	232-	A-10-	2313
W7DP/7	Walla Walla Valley RAC	342-	B-16-	2202
W1AQ/1	Assn. RA of Southern New England	303-	AB-20-	2190
W3CAB/3	Washington RC	281-	AB- 8-	2053
K6EAG/6	Hayward RC	272-	AB-12-	2040
WØRZT/Ø	Mississippi Valley RC	310-	B-16-	1860
W6PML/6	Santa Maria RC	261-	AB-10-	1782
W1GES/1	North Shore R Assn.	234-	AB-14-	1689
W1QRS/1	Stratford RC	240-	A-15-	1551
KØHVX/Ø	Wheat Belt RC	237-	B-24-	1422
W4NPT/4	Fuetuiant ARC	200-	AB-11-	1386
KL7AA/KL7	Anchorage ARC	190-	B-10-	1290
W3UEN/3	Washington County ARC	215-	ABC- -	1245
WØEQU/Ø	Ak Sar Ben RC	202-	B-16-	1212
W8EMG/8	Blennerhassett ARC	175-	AB- -	1077
W1VPU/1	Shelton Emergency R Assn.	140-	AB-16-	915
W1BIM/1	Central Massachusetts AR Assn.	136-	ABC- 9-	843
K8ATI/8	Tri-County ARC Assn.	109-	AB-14-	666

Six Transmitters Operated Simultaneously

K2AA/2	South Jersey R Assn.	1474-	A-80-	13,401
W7HZ/7	Valley ARC	1163-	A-41-	10,467
W2KOJ/2	Watchung Valley RC	969-	A-42-	8946
W98W/9	Chicago Suburban R Assn.	736-	A-45-	6849
W98WQ/9	Four Lakes ARC	607-	A-50-	5688
K6AGF/6	Tri-County AR Assn.	602-	A-35-	5418
KH6WO/KH6	Honolulu ARC	797-	B-25-	4944
W2DB/1	Westchester AR Assn.	709-	B-29-	4254
W8OLO/8	Gentile MARS Group	648-	AB-42-	4137
W2US/2	Suffolk County RC	620-	B-21-	3720
W1NEM/1	Hartford County AR Assn.	355-	A- 6-	3420
W1MHL/1	Waltham AR Assn.	391-	AB-20-	3309
K8HIL/8	Marietta ARC	344-	A-16-	3096
W8ID/8	Seneca RC	462-	AB-25-	2976
VE3ZM/3	Guelph ARC	315-	AB-22-	2739
W8RNF/8	Lake-Geauga ARC	448-	B-35-	2676
W8OCK/8	Central Michigan ARC	439-	B-20-	2634
K1BCI/1	CQ RC	378-	AB-39-	2559
W3PIQ/3	South Hills Brass Pounders & Modulators Club	337-	AB-25-	2409
K4GVV/4	Panama City ARC	368-	B-10-	2358
W3BN/3	Reading RC	361-	B-20-	2166
W3CTC/3	Delaware Valley ARC	297-	ABC-15-	2118
W8WNK/8	(noneclub group)	304-	B-21-	1974
W9DUA/9	Sangamon Valley RC	305-	AB-30-	1857
W9BA/9	St. Clair ARC	351-	BC-35-	1761
K4VLY/4	Morganton ARC	279-	AB-12-	1683
VE6NQ/6	Calgary AR Assn.	181-	AB- 9-	1278
W7KYC/7	Portland ARC	203-	AB-25-	1221
W7GUX/7	Sheridan RA League	20-	B- 8-	120

Seven Transmitters Operated Simultaneously

W2VDJ/2	Lakeland AR Assn.	1368-	A-18-	12,537
W2GTD/2	Ridgewood RC	1177-	A-14-	10,818

Wright-Patterson Communicators Club, K8AIR/8

W7DK/7	RC of Tacoma	930-	A-41-	8595
W5CF/5	Kilocycle Club	914-	B-19-	5658
K6BTR/6	Mountain View ARC	724-	AB-14-	5352
W6PW/6	San Francisco RC	858-	AB-31-	5343
W1ECO/1	Sub Sig ARC	533-	A-43-	5022
W6OTX/6	Palo Alto AR Assn.	601-	AB-20-	4944
W1GLA/1	Framingham RC	535-	A- -	4815
W4EOH/4	Jefferson County AREC	576-	AB-28-	4680
W6PMK/6	North Peninsula Electronics Club	506-	A-13-	4554
W6WWJ/6	South County AR Soc.	617	AB-25-	4397
W6LMN/6	San Mateo RC	551-	AB-30-	4149
W3CWD/3	Antietam R Assn.	424-	AB-15-	4026
W4MOE/4	Asheville ARC	526-	B-17-	3306
W8DZK/8	Ft. Hamilton AR Assn.	650-	A-15-	1950
K6DBS/6	Convair RAC	349-	BC-12-	1863
K4EWE/4	Greeneville ARC	252-	AB-13-	1524
W3LDV/3	Anthracite Wireless Assn.	237-	C- 7-	786

Eight Transmitters Operated Simultaneously

W2JIO/2	Fordham RC	1952-	A-52-	17,793
W6UW/6	Santa Clara County AR Assn.	1186-	AB-30-	8682
W5DPA/5	Houston ARC	853-	AB-35-	5979
K6QZJ/6	Riverside County AR Assn.	470-	A-26-	4455
W6BXN/6	Turlock ARC	662-	AB-25-	4119
W1AEW/1	Pioneer Valley RC	435-	AB-35-	3285

Nine Transmitters Operated Simultaneously

W1OC/1	Concord Brasspounders	1656-	A-25-	14,904
W6TOI/6	Downey ARC	1166-	AB-26-	8607
W7NCW/7	Lower Columbia AR Assn.	807-	AB-27-	5943
W9UVI/9	Peoria Area ARC	329-	A-28-	2961

Ten Transmitters Operated Simultaneously

WØGM/Ø	Cedar Valley ARC	396-	AB-40-	2640

Eleven Transmitters Operated Simultaneously

W2GSA/2	Garden State AR Assn.	2590-	A-43-	23,553
W5SC/5	San Antonio RC	2099-	AB-35-	16,050
K6DTA/6	West Valley RC	1629-	A-42-	14,796
W3RCN/3	Rock Creek AR Assn.	1143-	A-75-	10,584
W9RK/9	Northwest ARC	1101-	A-33-	10 134
VE3NAR/3	Nortown ARC	735-	AB-42-	4740
W3GV/3	R Assn. of Erie	381-	AB-35-	3126

Twelve Transmitters Operated Simultaneously

W2LL/2	Tri-County R Assn.	2064-	A-56-	18,711
K6EA/6	Associated RA of Long Beach	1690-	AB-62-	11,859

Thirteen Transmitters Operated Simultaneously

W6UF/6	Elmac Gang RC	2449-	ABC-65-	12,786

CLASS B

Grouped in this listing are the scores of portable stations manned by one or two operators. Where two persons participated, the call of the other operator (if known) is given below that of the amateur whose call was used. Figures following the calls indicate number of contacts, power and final score.

One Transmitter

K6GOI/6	323-	A-4725	
W6AWF			
K6QIK/6	294-	A-3969	
K6QHZ	402-	A-3843	
W3M8R/8			
W2JBQ/2	228-	A-3416	
W2FBA			
W6DUS/6	319-	A-3096	
W7K8E			
K4KUZ/4	383-	B-2448	
K4QHG			
K5DRC/5	242-	A-2403	
K5ATD			
W6IXK/6	400-	B-2400	
W6WII			
KN2LFK/2	142-	A-2309	
K2TXD			
W8MZA/8	223-	A-2232	
W8EOP			
W5YFN/5	369-	B-2214	
K7ANM			
W9YYG/9	220-	A-2205	
W9UBI			
W5NXE/5	218-	A-2187	
W5RMH			
K9IBB/9	238-	A-2142	
W3TLN/4	153-	A-2066	

Lakeland Amateur Radio Assn., W2VDJ/2

K2UTV/2	204	A	2061
WV2AKK			
W7CAF/7[2]	331	B	1986
W7NQP/7[2]	170	A	1755
W5PTK/5	279	B	1674
K5BFE			
K5KB8/5	182	A	1638
W5VC/5	269	B	1614
K5EMA			
K4LDR/4	171	A	1539
W4WHK			
W3EMD/3	248	B	1488
W3JYW			
W9OEY/9	81	A	1431
W9OHU			
W8SKU/8	156	A	1404
K8CCV			
K2DRN/2	152	AB	1380
K2RUU			
K7BSO/7[2]	99	A	1337
W9UXT/9	213	B	1278
K9AQO			
W3EEB/3	140	A	1260
W3DQZ			
W9KRD/9[2]	184	B	1254
K2MBU/2	66	A	1229
K2MKC			
W6MBN/6	193	AB	1191
W6MVQ			
K2SF8/2[2]	107	B	1188
W5VVF/5	130	A	1170
K2PGC/2	165	B	1140
K2PSR			
W2TXU/2	126	A	1134
W8OEQ/8[2]	155	B	1080
W9PBI/9	95	A	1080
W9TKX			
W6NKR/6	173	B	1038
K6ZPE			
W9WIE/9[2]	50	A	1026
K8CXY/5			
W5ECS	170	B	1020
K6BKN/6	113	A	1017
K6JLR			
W7GU8/7	87	A	1008
W7BJW			
W9RZM/9	131	B	942
W9JJT			
VE2AKX/2	130	B	930
VE2AVF			
W7GZN/7	76	A	909
K7AWP			
W8HUP/8	67	A	905
K2KGJ/2	100	A	900
K2SY8/2	119	AB	900
K2HVI			
K7AMW/7	150	B	900
W7GRA			
K6YEA/6[2]	96	A	882
W4RWM/4	35	A	810
W7UPS/7	269	C	807
W7VIU			
W7UNV/7	133	B	798
W7TXZ			
W1OJR/1	34	A	797
W3FIM/3[2]	59	A	797
W8EWT/8[2]	131	B	792
K6IYM/6	87	B	783
K6MZZ			
K9AXD/9	127	B	762
K9CYU			
K6ALJ/9	55	A	738
W1OEO/1[2]	117	B	702
K6VDG/6	51	A	689
K9IBW/9[2]	88	B	672
W9OMT/9[2]	112	B	678
K9HAA/9	100	AB	672
K9CYV			
K4KAK/4[2]	111	B	666
W7GVV/7	110	B	660
W7PIK			
VE1TV/1	109	B	654
VE1ACE			
W8JXU/8	72	A	648
K8AXD			
K2SOW/2	46	B	639
W2TGR			
W1UWU/1	70	A	630
W1FJG			
K2RDJ/2	46	A	621
K2TIU			
K5MIA/5[2]	102	B	612
K8SCH/6			
K6EDE	62	A	558
W7VCB/7	92	B	552
K4DVM/4	91	B	546
W18MO/1	60	A	540
K8DKU/8	89	B	534
VE3BOY/3			
VE3CIR	13	A	513
K2AZJ/2			
K2VXA	56	A	504
W8FNI/8[2]	153	AB	503
W7AGE/7			
W7NCB	36	A	486
K4EIE/4	54	B	474
W9TRF/9[2]	50	B	450
K6MID/6	33	A	446
W2CGK/2[4]	148	A	444
K6SAF/6			
WA6ADL	74	B	444
W7FTD/7			
W7F8P	69	B	414
K9EKA/9			
K9DVO	44	A	396
W3YNC/3	42	A	378
W4FLX/4	63	B	378
W6EUH/7	185	B	370
WN2TNP/2	1	A	351
W9CHD/9			
K9D8E	57	B	342

CLUB AGGREGATE MOBILE SCORES

Westpark Radiops	71,717
Radio Amateur Mobile Society of Sacramento	14,278
Associated Radio Amateurs of Long Beach	12,424
Phil-Mont Mobile Radio Club (Penna.)	11,992
West Philadelphia Radio Assn.	5320
Norwalk Amateur Radio Club (Calif.)	1917
Mobile Amateur Radio Club of South Bend	1634
Denver Radio Club	945
Atlanta Radio Club	784
Redwood Falls Amateur Radio Club (Minn.)	563
Connecticut Wireless Assn.	518
Hughes Amateur Radio Club (Calif.)	500
Coffee Dunkers of Detroit	135
Central Queens Radio Club	81
Hastings Amateur Radio Club (Nebr.)	45
Shelby County Radio Club (Ind.)	36

W6CI8/6	134	B	318
W9ANE/9[2]	102	C	306
K9M2N/9			
K9IFC	33	A	297
KL7COJ/KL7	49	B	294
W8RRD			
W2UJS/2	30	A	270
W1OAK/1	43	B	258
K5GFM/5			
K5LTO	3	A	252
K2UVL/2[2]	83	A	249
WN6NOK/6[2]	41	B	246
W9FCC/9[2]	38	B	228
W1IWK/1[2]	75	A	225
KN5QFL/5			
KN5QJR	25	A	225
K6DXA/6	36	B	216
K5HWY/5	141	C	166
K2VAB/2			
K2SBT	70	B	140
W6IAH/6			
W6EA	10	A	135
KN8HVV/8[2]	15	A	135
W5QNT/5	20	B	120
K6TIP/6	38	A	114
K3AKR/3	46	B	92
VE4JW/4[2]	13	B	78
K2UUT/2	22	A	66
W1EZM/1			
W1LCI	30	B	60
K6ZWB/6			
W6YND	6	A	54
K7BAH/7[2]	14	A	42
WN2RZK/2	4	B	36
W8QIW/8	5	B	30
KN8IPK/8	10	A	30
W5CIN/5	6	C	18

Two Transmitters

K5DCO/5	370	A	3330
K5DGI			
K6HGF/6	291	A	2880
W6OQI			
VE2NI/2	269	A	2646
VE2BN			
K4DTI/4[3]	256	A	2529
W3EAN/3[2]	251	B	1506
K2SBT/2			
K2YTD	91	A	1044
K4JXL/4			
K4LNU	81	B	486
W9BYC/9	68	B	408
VE3DSA/3			
VE3JY	52	A	156
W8ELE/8			
K8AQP	15	A	45

CLASS C

Grouped in this tabulation are the scores of entrants in the mobile class. Figures following the call indicate number of contacts, power and final score.

One Transmitter

W8PVC/8	280	A	5036
K6EPC/6[5]	213	A	3213
W8GMK/8	94	A	2525
W8OHA/8	94	A	2525
W8QAV/8	80	A	2336
W8MME/8	75	A	2268
W8AEU/8	74	A	2255
W8QXG/8	74	A	2255
W8NYX/8	70	A	2201
W8PVA/8	68	A	2174
W8OXI/8	66	A	2147
K8ABA/8	66	A	2147
W8RAZ/8	65	A	2133
W8WZS/8	65	A	2133
W9LPA/9	221	AB	2124
W8AGA/8	64	A	2120
W8BDZ/8	64	A	2120
W8BUQ/8	64	A	2120
W8CVW/8	64	A	2120
W8CZM/8	64	A	2120
W8FKB/8	64	A	2120
W8GHC/8	64	A	2120
W8NGY/8	64	A	2120
W8NMA/8	64	A	2120
W8NOX/8	64	A	2120
W8 MU/8	64	A	2120
W8PZR/8	64	A	2120
W8QYS/8	64	A	2120
W8UZJ/8	64	A	2120
W8VUI/8	64	A	2120
W8ZEU/8	64	A	2120
W8ZJQ/8	64	A	2120
K8CLH/8	64	A	2120
W3VXN/3	107	A	1782
W3CNO/3	98	A	1661
W6GTG/6	81	A	1431
W8NZI/8	65	B	1422
W6GGW/6	73	A	1324
K6EWH/6	67	A	1242
W6OPY/6	66	A	1229
K6VUZ/6	60	A	1148
K6OOP/6	84	A	1134
W3HA8/3	52	A	1040
W6BRT/6	21	A	972
W6QHP/6	47	A	972
W9PUH/9[2]	80	B	945
W6GAU/6	12	A	864
W6BTP/6	63	A	851
W6KQI/6	11	A	851
W6GKM/6	9	A	824
W3YFV/3	35	A	810
W6MRU/6	8	A	810
W8NOW/KH6	89	B	810
W6VNC/6	34	A	797
K2DGE/3	34	A	797
W3PXY/3	33	A	783
W6YQH/6	6	A	783
K6DJE/6	33	A	783
K6KNP/6	6	A	783
W6UG/6	5	A	770
K6CPX/6	5	A	770
K6PFM/6	5	A	770
W3GOW/3	31	A	756
W6QPB/6	4	A	756
W6SHX/6	5	A	756
K6PQZ/6	4	A	756
W3AJO/3	30	A	743
K6IFU/6	3	A	743
W3VVS/3	28	A	716
W3AHX/3	27	A	702
K6IXU/6	27	A	702
K9CAZ/9[7]	103	AB	693
W3HAU/3	24	A	675
K6YMT/6	50	A	675
K6HYC/6	23	A	648
W3BBB/3	22	A	635
W6ENR/6	47	A	635
K6MOG/6	22	A	635
W3QQH/3	21	A	621
W3UZF/3	20	A	608
W6QPX/6	20	A	608
K6BJU/6	20	A	608
W7HOE/7	40	B	585
W3HGJ/3	18	A	581
K4AJI/4	43	A	581
W3MHR/3	17	A	567
W6IQF/6	42	A	567
K6JNV/6	13	A	567
W4US8/4	37	B	558
W6VHT/6	15	A	540
W9TWA/9	40	A	540
W3FDJ/3	14	A	527
K8SWZ/6	14	A	527
W3DSG/3	13	A	513
W9TIL/9	38	A	513
W9INF/9[2]	84	B	504
W6ZVD/6	36	A	486
W3ILD/3	27	B	468
W3LKI/3	7	A	432
W1IGG/1	6	A	419
W1BDI/1	5	A	405
W3IVD/3	4	A	392
W2SAL/3	4	A	392
K6MWV/6	4	A	392
W6PB/6	2	A	365
W3GOQ/3	1	A	351
W3GOV/3	4	A	351
W3JXI/3	1	A	351
W3JXS/3	1	A	351
W3ZHE/3	1	A	351
K3DBP/3	1	A	351
W6KT8/6	25	A	338
W6KAI/6	7	B	288
KN6SE8/6	20	A	270
W5FIX/5	27	B	243
KN6LFC/6	17	A	230
W4FYH/4	15	A	203
K6ZGI/6	15	A	203
W6GEB/6	12	A	162
W9AYU/9	12	A	162
W9MYI/9	12	A	162
W1WUR/1	17	B	153
W9BRM/9	11	A	149
W6ZNM/6	9	A	149
W8CBM/6	10	A	135
W6UCF/6	12	B	126
K6KDK/6	8	A	108
K9EUJ/9	8	A	108
W1KJM/1	10	B	99
W6LJC/6	4	B	36
K9GCU/6	4	B	36
W2IUX/2	2	A	27
K2DZA/2	2	A	27
K2TWZ/2	2	A	27
W1HDQ/1	1	A	14
W6KKM/6	1	B	9

Two Transmitters

K2TOM/2[9]	298	A	4361
W2GBX/2[10]	123	A	1998
K6IC8/6[7]	57	AB	591
W2KOO/2[11]	27	B	468
W9SWD/9[12]	36	A	351

CLASS D

Grouped in this tabulation are the scores of home stations operated from emergency power.

K3CJT [13] 470, W5RIN [14] 221, W3OI [15] 212, K9KCQ 13.

(*Continued on page 188*)

I.A.R.U. News

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Formosa: Hq MAAG, APO 63, San Francisco, California
France: R.E.F., BP 26, Versailles (8 & O).
France: (F7 only): F7 QSL Bureau, MARS, Headquarters U. S. European Command, APO 128, New York, N. Y.
Germany (DL2 calls only): **G. E. Verrill, G3IEC, 10 Seahorse St., Gosport, Hants, England**
Germany (DL4 calls only): DL4 QSL Bureau, **604th Comm,** APO 12, N. Y., N. Y.
Germany (DL5 calls only): Via France
Germany (other than above): D.A.R.C., Box 99, Munich 27
Gibraltar: E. D. Wills, ZB21, 9 Naval Hospital Road
Ghana: **9GIAB, John Burton, Telecommunication School, Post & Telecommunication Dept., ACCRA**
Great Britain (and British Empire): A. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent
Greece: George Zarifis, P.O. Box 564, Athens
Greece (Unlisted SV0s only): USASG, APO 206, New York, N. Y.
Greenland: **Commander 8th Air Force, Westover AFB, Mass.**
Grenada: VP2GE, St. Georges
Guam: **M.A.R.C.,** Box 145, Agana, Guam, Marianas Islands
Guantanamo Bay: Guantanamo Amateur Radio Club, Box 55, NAS, Navy 115, F.P.O., New York, N. Y.
Gualemala: C.R.A.G., P.O. Box 115, Guatemala City
Haiti: Radio Club d'Haiti, Box 943, Port-au-Prince
Honduras: O. A. Troches, P.O. Box 244, Tegucigalpa, D. C.
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong
Hungary: H.S.R.I., Postbox 185, Budapest 4
Iceland: Islenzkir Radio Amatorar, Box 1058, Reykjavik
India: P.O. Box 534, New Delhi
Indonesia: P.A.R.I., P.O. Box 222, Surabaja, Java
Israel: I.A.R.C., P.O. Box 4099, Tel-Aviv
Italy: A.R.I., Viale Vittorio Veneto 12, Milano, Italy
Jamaica: Ruel Samuels, VP5RS, 34 Port Royal Street, Kingston
Japan (JA): J.A.R.L., Box 377, Tokyo
Japan (KA): F.E.A.R.L., P.O. Box 111, APO 500, % Postmaster, San Francisco, Calif.
Kenya: East Africa QSL Bureau, Box 1313, Nairobi
Korea: Mr. In Kwan Lee, Chief Engineer, Radio Supervisory Bureau, O.P.I.R.O.K. Seoul (HL2AM via ARRL)
Kuwait: William N. Burgess, MP4KAC, % Kuwait Oil Co., Kuwait, Persian Gulf
Lebanon: R.A.L. B.P. 3245, Beyrouth
Liberia: (EL1s only) HARC, P.O. Box 32, HARBEL
Libya: 5A2TZ, Box 372, Tripoli
Liechtenstein: via Switzerland
Luxembourg: **R. Schott, rue Brouch 35, Esch/Alzette**
Macao: Via Hong Kong
Madagascar: P.O. Box 587, Tannarive
Madeira Island: P.O. Box 257, Funchal
Malaya: QSL Manager, Box 777, Kuala Lumpur
Malta: R. F. Galea, ZB1E, "Casa Galea", Railway Road, Birkirkara
Mauritius: V. de Robillard, Box 155, Port Louis
Mexico: L.M.R.E., Apartado Postal 907, Mexico, D.F.
Montserrat: VP2MY, Plymouth
Morocco: A.A.E.M., P.O. Box 2060, Casablanca
Morocco: (Tangier International Zone only): Box 150, Tangier
Mozambique: Liga doe Radio-Emissores, P.O. Box 812, Lourenco Marques
Netherlands: V.E.R.O.N., Postbox 400, Rotterdam
Netherland Antilles (Aruba): **Verona,** Postbox 392, San Nicolas, Aruba
Netherlands Antilles (Curacao): **Verona,** Postbox 383, Willemstad, Curacao
New Guinea: Via Papua
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington C1
Nicaragua: YN1RA, Apartado Postal 555, Managua
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 868, Oslo
Okinawa: O.A.R.C., P.O. Box 739, APO 331, % Postmaster San Francisco, Calif.
Pakistan: Box 4074, Karachi
Panama, Republic of: L.P.R.A., P.O. Box 1622, Panama
Paraguay: R.C.P., P.O. Box 512, Ansuncion
Papua: VK9 QSL Officer, P.O. Box 204, Port Moresby
Peru: R.C.P., Box 538, Lima

(*Continued on page 190*)

12th V.H.F. Sweepstakes, Jan. 10 and 11

Certificates to ARRL Section, Novice, Technician Winners; Gavel to Top-Scoring Club

ALL amateurs who can work 50 Mc. or higher are invited to get into the Twelfth ARRL V.H.F. Sweepstakes to work new states and make new v.h.f. acquaintances. The contest starts at 2:00 P.M. your local time Saturday, January 10, and continues until midnight Sunday, January 11.

Just call "CQ Sweepstakes" or "CQ SS" to get in touch with other contestants, then exchange SS information as shown in this announcement. This dope is similar to a message preamble, with the ARRL section (see page six of this *QST*) substituted for the city and state, and the signal report replacing the "check." You can rework a station for credit on each v.h.f. band, so ability to work 50, 144, 220, etc., pays off in additional score points.

The rules are unchanged except in one particular. While the contest still starts at 2:00 P.M. (1400) your local standard time, *contacts between stations in different time zones can be counted only when the contest period is in progress in both of the zones concerned.* The change was made because of the confusion resulting from a widespread 50-Mc. F_2 opening early January 4, 1958, at a time when the contest had begun for eastern competitors but not for westerners. For purposes of explanation, let's assume that Northern New Jersey's W2PRF, on EST of course, gets going right at the beginning of the 1959 contest. During the first hour, W2PRF can work only stations in the eastern time belt or other stations for whom the contest period is on — VE1s on Atlantic time, say. During his second hour, he can exchange SS preambles with W9s and others on CST because the contest has now begun there. By his fourth hour of operation, W2PRF can work as far west as W6-land and other amateurs on PST.

The scoring system adopted in the last V.H.F. SS continues in force, the multiplier consisting of the number of sections worked *plus ten.* Should W6NLZ make 100 contacts in 17 different ARRL Sections, his score would be computed as follows:

100 QSOs
×2 (if all SS data exchanged in both directions)
200 (QSO points)
×27 (17 sections plus 10)
5400 (claimed score)

Certificate awards will go to top-scorers in each of the 73 ARRL sections from which entries are forthcoming. In addition, a certificate will be given to the top Novice and Technician in each

SUMMARY OF A.R.R.L. V.H.F. SWEEPSTAKES EXCHANGES

Station..... Class License..... ARRL Section.....

	SENT (1 point)						*RECEIVED (1 point)*							
Freq. Band (Mc.)	*NR*	*Sta.*	*CK-RST*	*Section*	*Time ..ST*	*Date (Jan.)*	*NR*	*Sta.*	*CK-RST*	*Section*	*Time*	*Date (Jan.)*	*Number of Each Different New Section as Worked*	
50	1	W1AW	57	Conn.	4:15 P.M.	10	3	W1PHR	47	Conn.	4:18 P.M.	10	1	2
50	2		43		4:35 P.M.	10	7	W1QAK/1	59	Conn.	4:40 P.M.	10	..	2
50	3		58		9:09 P.M.	10	6	W1KCS	359	R. I.	9:11 P.M.	10	2	2
144	4		49		9:30 P.M.	10	32	W1OOP	58	E. Mass.	9:36 P.M.	10	3	2
144	5		57		9:50 P.M.	10	15	KN1DDO	58	Conn.	9:46 P.M.	10	..	2
50	6		54		11:30 P.M.	10	11	K2IEJ/2	48	N. Y. C.-L. I.	11:32 P.M.	10	4	2
420	7		58		11:35 P.M.	10	30	W1PHR	57	Conn.	11:35 P.M.	10	..	2
144	8		57		11:45 P.M.	10	21	W3CGV	59	Md.-Del.-D. C.	11:56 P.M.	10	5	2
144	..	...	..	...	.....	..	18	W9WOK	449	Ill.	12:34 A.M.	11	6	1
144	9	W1AW	34	Conn.	8:50 A.M.	11	7	W1RFU	59	W. Mass.	8:47 A.M.	11	7	2
50	10		479		9:18 A.M.	11	12	W6AJF	479x	S.F.	6:20 A.M.	11	8	2
50	11		589		10:40 P.M.	11	30	VE3AIB	599	Ontario	10:35 P.M.	11	9	2

Claimed score: 23 points × 10 (9 + 10) = 437. Bands Used: 50, 144 and 420 Mc. 9 sections worked

Names and calls of operators having a share in above work.....

Participating for club award in the.....(*name of Club*), *of which I am a member.*

I hereby state that score and points set forth in the above summary are correct and true.

Equipment..... *Signature*.....

Number of QSOs..... *Address*.....

EXPLANATION OF V.H.F. SS CONTEST EXCHANGES

Send Like Standard NR Msg. Preamble		*Call*	*CK*	*Place*	*Time*	*Date*
Exchanges	Contest numbers 1, 2, 3, etc., a new NR for each station worked	Send your own call	CK (Readability and strength or RST of station worked)	Your ARRL section	Send time of transmitting this NR	Send date of QSO
Purpose (example)	QSO NR tells how you are doing (NR1)	Identification (W1AW)	RS or RST report (589)	See page six for section list (Conn.)	Time and date must fall in contest period (6:55 P.M. Jan. 10)	

section where at least three such licensees submit valid logs. Clubs are invited to get their members on the air from their individual stations to complete for the certificate issued to the leading operator in each club. The club whose members pile up the top aggregate score will also receive a handsome cocobolo gavel with a sterling-silver band engraved with the name of the winner.

Contest reporting forms are now available from the ARRL Communications Department on request. If you don't use these log sheets, please follow the log arrangement shown. ARRL welcomes all contest reports to assist in the checking and to make complete results in *QST* possible. *Novices and Technicians:* be sure to report your totals, large or small, so that the license-class leader in your section can qualify for a certificate.

The last V.H.F. Sweepstakes was history's biggest v.h.f. contest, with nearly 1200 amateurs joining in the fun. Why not look over the results of that one in April, 1958, *QST* for an idea of your local competition. Then stand by to give the gear a real workout January 10 and 11!

Rules

1) *Eligibility:* Amateur operators in any ARRL section (see page 6) operating at home, or mobile or portable *under one call* on or above 50 Mc. are invited to take part.

2) *Object:* Participants will attempt to contact as many other stations in as many ARRL sections as possible.

3) *Contest Periods:* The contest starts at 2:00 P.M. your local time, Saturday, Jan. 10, 1959, and ends at midnight, Sunday, Jan. 11, 1959. Contacts between stations in different time zones can be counted only when the contest period is in progress in both of the zones concerned.

4) *Exchanges:* Contest exchanges, including all data shown in the sample, must be transmitted and receipted for as a basis for each scored point.

5) *Scoring:* (a) Contacts count *one point* when the required exchange information has been received and acknowledged, a *second point* when exchange has been completed in both directions.

(b) Final score is obtained by multiplying total contact points by the sum of different ARRL sections worked (the number in each of which at least one 88 point has been credited) plus 10.

6) *Conditions for Valid Contact Credit:* (a) Repeat contacts on other bands confirmed by completed exchanges of *up to two points per band* may be counted for *each different station* worked. (*Example:* W1HDQ works W1RFU on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only *one* section multiplier.)

(b) Cross-band work shall not count.

(c) Portable or mobile station operation under one call, from one location only, is permitted.

(d) A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.

(e) Contacts with aircraft mobiles cannot be counted for section multipliers.

7) *Awards:* Entries will be classified as single- or multi-operator, a single-operator station being defined as one manned by an amateur who neither receives nor gives assistance to any person during the contest period. Certificates will be awarded in each ARRL section to the top-scoring amateur in the single-operator classification. In addition, a certificate will be awarded to the top Novice and Technician in each ARRL section where *at least three* such licensees submit valid contest logs. Multioperator work will be grouped separately in the official report of results in *QST*.

When three or more individual club members compete and submit logs naming the club with which they are identified, an ARRL certificate will be issued to the leading club member. When less than three individual logs are received there will be no club award or club mention.

A gavel with an engraved sterling-silver band will be offered the club whose secretary submits the greatest aggregate score, provided such scores are confirmed by receipt at ARRL of the *individual contest logs* from such members. Only the score of a bona fide club member, operating a station in local club territory, may be included in club entries. Claims from federations, radio club councils, or other combinations of radio clubs, will not be accepted, nor can special memberships granted for contest purposes be recognized.

8) *Conditions of Entry:* Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

9) *Reporting:* Reports must be postmarked no later than Jan. 28, 1959, to be considered for awards.

Strays

The Air Force MARS Eastern Technical Net (Sundays 1400–1600 EST on 3295, 7540 and 15,715 kc.) will offer the following during December:

Dec. 7 — Navigation by Electronics
Dec. 14 — New Concepts in Communication Systems
Dec. 21 — Uni-Directional Antennas
Dec. 28 — Impact of Solid State Physics in Electronics.

Each program will feature a speaker from the Rome, N. Y., Air Development Center.

—···—

Check your *Call Book* — you'll find that K5LNV is a *real* Texas call.

Hints and Kinks For the Experimenter

TWO-METER GROUND PLANE

THE two-meter ground plane antenna described here is not only inexpensive but also has good appearance qualities generally nonexistent in ham-band antennas.

Construction is simplicity itself. A standard one-inch pipe end cap available at any hardware store makes up the base. A hole large enough to receive a ½-inch ceramic feed-through insulator is cut in the top of the cap and four equal-spaced 1/8-32 tapped holes are made in the flange. These holes should be at least ½ inch from the edge of the flange to avoid thread damage when the mast is screwed into place. The holes should be drilled with a press if possible to assure perfect alignment.

Next, five pieces of 1/8-inch drill rod are cut to length. We used the formula from the *Handbook* to determine the required length. Four of the rods are threaded for ½ inch and the fifth is threaded approximately 1½ inches.

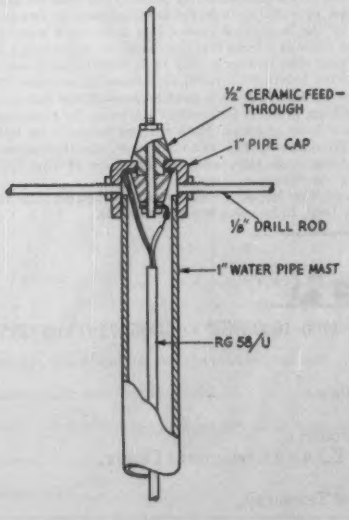
Prepare the coax feed line as shown in the sketch. We used a solder lug with 5/8-inch inside diameter for the shield and a 1/8-inch solder lug for the center conductor. Assemble the vertical, the rod with the long thread, as follows: First, a self-locking nut goes on, then the top half of the insulator. Slip this into the top of the pipe end from the outside, followed by the shield conductor lug, making sure the surface of the inside of the cap and the lug make good contact. Install the other half of the insulator, followed by a washer, the center conductor terminal and a nut. Tighten the assembly with the self-locking nut on the outside to avoid twisting the conductor.

Now run a self-locking nut on each of the four remaining rods. Screw the rods into the holes around the flange and tighten up on the nuts. We use a piece of one-inch water pipe 25 feet long fastened to the side of the house at the bottom and at a point six feet from the bottom. No guy wires are needed and no feed lines are visible.

No electrical measurements of the performance of the antenna have been made here, but from an operating standpoint its performance is outstanding.

— *Dale Westfall, KØGNP/4*

Fig. 1—Details of the two-meter ground plane.



TUNING THE HELIWHIP TO FREQUENCY

MANY of us would like to tune the "Heliwhips" to frequency but don't like the idea of unwinding turns to raise the frequency of resonance. Tuning can be done very easily by winding a sleeve of aluminum foil so that it covers a few turns at the bottom of the tightly wound portion of the whip. After the correct number of turns have been covered, wind plastic tape over the foil for protection.

If the desired frequency is lower than the natural resonant frequency, tape containing ferrous material, such as audio recording tape, might be tried.

— *Milford W. Noe, W6IMW*

DON'T CLEAN CERAMIC MATERIAL!

KEEPING equipment clean plays an important role in routine equipment maintenance. However, care should be exercised when using solvents such as alcohol, carbon tet, or other wax dissolving substances around ceramic material such as steatite, isolantite, etc.

Most ceramic material used in switches, tube-sockets and the like are impregnated at the factory with a waxy substance. This prevents moisture from collecting in the small pores of the material. When this substance is removed by the cleaning solvent, the voltage breakdown point of the material is decreased, leakage may develop, and general insulating quality, especially at high frequencies, will suffer.

Q MULTIPLIER FOR BC-312 OR BC-342

HERE is a hint for users of the BC-312 or BC-342 who wish to use these receivers with the Heathkit Model QF-1 *Q* Multiplier. The QF-1 will not tune to the BC-312 i.f. of 470 kc. To make the conversion refer to the QF-1 schematic and you will see a 3300-$\mu\mu$f. silver-mica

capacitor in the tank circuit. Replace this capacitor with one with a value between 2800 and 3000 $\mu\mu$f., and retune the inductor to 470 kc. by adjusting the tuning slug.

Using a 2800-$\mu\mu$f. ceramic capacitor, the circuit came to resonance with the slug almost all the way in; so, if normal tolerances will not permit tuning to resonance at 470 kc., try a capacitor of 3000 $\mu\mu$f. Although I used an available ceramic capacitor which works very well, it is possible that the recommended silver-mica unit would improve the selectivity and *Q*. As it is, with the BC-312 series having such broad selectivity, the *Q* multiplier is a welcome addition when the going gets rough.

— Harry K. Long, W7CQK

SQUELCH CIRCUIT FOR HALLICRAFTERS S-85

An increasingly useful feature of some communications receivers is a circuit used for silencing the receiver when no signal is being received. However, many recent receivers do not incorporate this feature. The schematic (Fig. 2) shows a squelch circuit which can be used with the Hallicrafters S-85, simply by plugging the unit into the socket provided for the 6H6 a.v.c., a.n.l. and detector tube. The circuit, which requires no modification of the receiver whatsoever, is simple and quite effective.

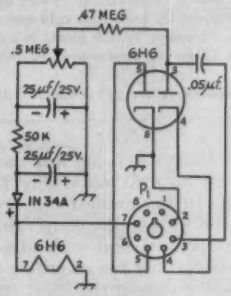


Fig. 2—Squelch circuit for the S-85. All resistors are ½ watt.

A variable negative bias voltage is obtained by rectifying filament voltage. This is accomplished by feeding the filament voltage to the cathode side of a 1N34A and applying the negative voltage to a filter circuit. Note that the positive end of the electrolytic capacitors is grounded. The load resistor for the bias supply is a 500K pot which allows the bias voltage for the 6H6 to be varied.

A blocking capacitor in the plate of the noise limiter section of the 6H6 (which serves as the squelch tube) isolates the a.v.c. bus from the plate, thus allowing external negative bias to be applied without biasing the r.f. and i.f. tubes to cutoff. The audio input to the circuit is taken from this capacitor.

The cathode of the a.n.l. section of the 6H6 is connected just as it is normally in the receiver. This connection applies a.v.c. voltage to the cathode in the presence of a signal, and also serves as an audio output for the circuit.

The circuit then operates as follows: The variable negative bias obtained from the bias supply is applied through an isolation resistor to the plate of the a.n.l. section of the 6H6, making the plate negative with respect to the cathode. In this condition, the diode does not conduct and no audio is heard from the receiver. When a signal is present, the a.v.c. voltage applied to the cathode makes the cathode more negative than the plate and the diode conducts, passing audio. Since the plate bias voltage is variable, the signal strength required to operate the squelch circuit can be adjusted. Running the squelch control about one-third open will squelch the receiver noise in most cases.

The entire unit can be built into a small Minibox. An octal socket is mounted on one end of the box with an octal plug, P_1, on the other. The squelch control is mounted in the center of the box. In operation, the entire unit is plugged into the 6H6 socket in the receiver and the 6H6 is then plugged into the top of the box.

Once the unit has been plugged into the receiver, it is only necessary to throw the a.n.l. switch to its ON position to place the squelch in operation. Squelch level is determined by the setting of the squelch control on the unit. If it is desired to operate the a.n.l. circuit as intended without the use of squelch, the squelch control is set at minimum. This removes all bias from the plate of the a.n.l. circuit and allows it to function normally. To remove squelch or a.n.l. functions from the receiver, simply turn the a.n.l. switch to its off position.

— Bruce L. Mackey

KEEP IT CLEAN

Users of forced air-cooled tubes such as the 4X150, 4CX250B, PL172, etc., should pay attention to the small print on the tube data sheet which says, "Clean the air system periodically." The blower blades in particular will pick up quite a bit of dust and lint which becomes packed between the blades, with the result that the output of air and the life of expensive tubes are reduced considerably. A pipe cleaner moistened in water is ideal for cleaning both the blower blades and the cooling fins of the tube. Cleaning should be done every two months.

— Melvin Leibowitz, W3KET

A TRANSISTORIZED TUNABLE CONVERTER

While it is perhaps cheaper to build a converter using tubes, it is very interesting to try the same project using transistors. The transistorized version can be used with a transistor car receiver with no power problems, and is small in size. The converter described here is designed for fifteen meters, mainly because ten meters is still hard to hit with inexpensive transistors, and the lower frequency bands have quite a bit of QRM. There is no reason, of course, why the converter could

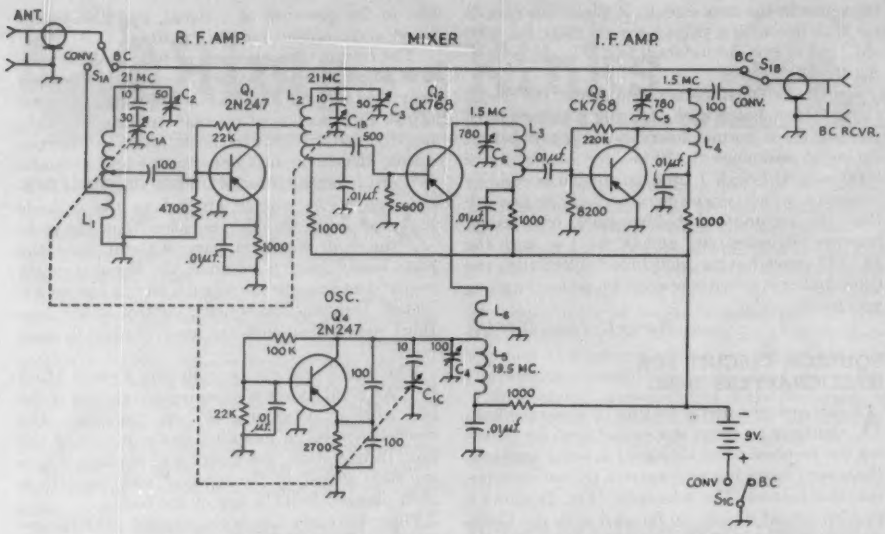


Fig. 3—Circuit of the Transistorized Tunable Converter. Unless otherwise indicated, capacitances are in $\mu\mu f$. resistances are in ohms, resistors are ½ watt.

C_1—30-$\mu\mu f$. 3-section variable capacitor (three-ganged Cardwell type PL-6003 trim-air midgets).

C_2, C_3—50-$\mu\mu f$. air trimmers.

C_4—100-$\mu\mu f$. air trimmer.

C_5, C_6—780-$\mu\mu f$. mica trimmers.

L_1—9 turns No. 22 enam., ¼ inch long, ¾-inch diam., tapped 3 turns from cold end. Link is one turn No. 22 enam. wound near cold end of above coil.

L_2—12 turns No. 22 enam., ⅜ inch long, ½-inch diam., tapped at 2nd and 7th turn from cold end.

L_3, L_4—No. 32 enam. close-wound, ½-inch diam., 1 inch long, tapped 20 turns from cold end.

L_5—7 turns No. 22 enam., ½-inch diam., ¼ inch long.

L_6—4 turns No. 22 enam., close-wound ¼ inch above top of L_5.

S_1—3-pole 2-position rotary switch (Centralab PA-2007).

not be built for the other bands just by changing the coils.

The converter is of the tunable type with a fixed output frequency somewhere in the broadcast band (in this case, 1500 kc.). The ultimate performance obtainable from this type of converter is higher than from the fixed-frequency type because the front end need not be broadbanded. The converter is powered by a small 9-volt battery mounted inside the case, and since the total current drain is less than 3 ma., the battery should last for quite a while.

No particular constructional details are needed; the layout can be left up to the individual constructor.

The circuit used for the oscillator is a Colpitts. Stability was hard to come by when using a transistor at 19.5 Mc., but after many circuit modifications, the oscillator drift was cut down to about 5 kc. in a half hour from a cold start. It was found necessary to use a high-C circuit in the oscillator to get any usable stability at all, and the size of the base bias and emitter stabilizing resistors radically affected the performance of the oscillator, while changes in the base loading resistor did not have too much effect. One peculiar thing observed about the oscillator was its extreme sensitivity to temperature changes; heat from a quick touch of a soldering iron would send it drifting many kc. It was found that the oscillator could be made to drift noticeably by simply blowing on it. In the finished converter, every effort was made to keep the temperature stable.

The mixer operated best with absolutely no bias at all, which is not too surprising since that must be its most nonlinear condition. By vacuum tube standards, a lot of local oscillator injection was required. Several methods of injecting the signal were tried, but the method shown here reduced the "pulling" of the local oscillator when tuning the mixer to a minimum.

The r.f. amplifier is straightforward, with the size of the bias resistor being the most critical item. The base had to be coupled near the bottom of the coil before the base tuned circuit would have any selectivity at all. This tuned circuit was very easily loaded by the antenna, and one turn in the primary seemed to give maximum signal transfer and front-end selectivity.

The i.f. stage was thrown in as an afterthought, since an old automobile broadcast set was used. However, the converter had gain to spare, so there was probably no real need for this stage. The method of coupling this stage to the car receiver was determined purely by experimentation, and may require a little modification with other types of receivers.

— H. A. Ross-Clunis, jr., W6GRZ

PUSH-TO-TALK FOR THE COMMUNICATOR I AND II

MOBILE operation using the Communicator I and II can be made much safer and more convenient by adding a push-to-talk circuit. All that is required is a solenoid, a spring, and a couple of screws. Drill holes in the send-receive knob and in the bottom of the Communicator cabinet. Connect the spring (an old dial spring will do) to the send-receive knob and to the screw that holds the tuning eye shield to the cabinet. (see Fig. 4). Mount the solenoid (which can be obtained from an old pinball machine.) on a bracket and screw it to the bottom of the cabinet. The solenoid can be keyed by the push-to-talk switch in the microphone.

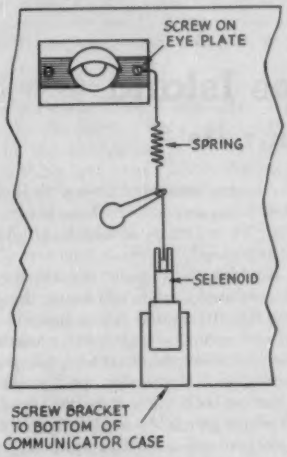


Fig. 4—Sketch showing details of Communicator I and II push-to-talk feature.

When you decide that it's time to trade in the Communicator, remove the spring and solenoid and all you have is a scarcely-visible screw hole in the cabinet bottom.

— E. V. Blaize, jr., W5TVW

SERIES OR PARALLEL TUNING WITH THE HEATH AC-1

ONE of the shortcomings of the Heath AC-1 antenna coupler is that it is parallel tuned only. This sometimes makes it difficult to feed certain antennas.

However, the coupler in use at KN3BZI was very easily modified for both series and parallel tuning with a minimum of extra components. All that was used was a d.p.d.t. toggle switch and some Scotch electrical tape.

Disregarding the built-in low-pass filter switch and output indicator, which are not affected by the modification, the effective circuit of the AC-1 is shown in Fig. 5.

In this circuit, the inductance L_1 and the transmitter link L_2 are in series. The combined inductances are then a parallel-tuned circuit with respect to capacitor C_1. All that is needed is insulation of rotor C_1 from the chassis and provision for a method of switching the circuit to insert C_1 in series or in parallel with L_1 as desired.

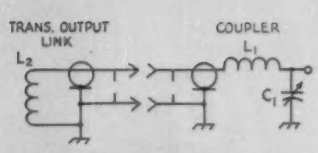
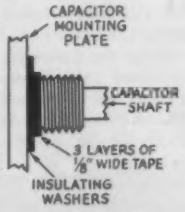


Fig. 5—Basic diagram of the AC-1 antenna coupler. C_1L_1—Original AC-1 capacitor and inductance.

To insulate the capacitor, the coupler is removed from its case and C_1 is removed from its mounting hole in the front panel. The bushing for the rotor is insulated by making several washers of electrical tape or other thin insulating material. The washers are cut so that the center hole is a snug fit over the bushing. They are then slid over the bushing to the front mounting plate on the capacitor. After the washers are in place two or three wraps of tape are made around the bushing. The tape should be slightly wider than the thickness of the front panel. This is shown in Fig. 6.

Fig. 6—Sketch showing modifications to C_1.



The mounting hole is then enlarged sufficiently to allow the tape to go through, and the capacitor is replaced in the panel. Several more of the washers are then placed over the bushing and pushed against the panel. These should be large enough to prevent contact between the panel and the lock nut of the capacitor.

After the capacitor is completely insulated from the cabinet, the leads from the coil to the capacitor are removed from the capacitor and the lead from the neon bulb is removed from the coil. A d.p.d.t. switch is mounted where convenient (at KN3BZI the output indicator was moved from the panel to the back of the cabinet and the switch mounted in its place). The switch is then wired as in Fig. 7.

(Continued on page 188)

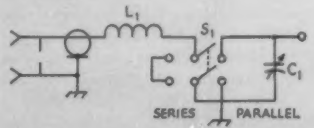
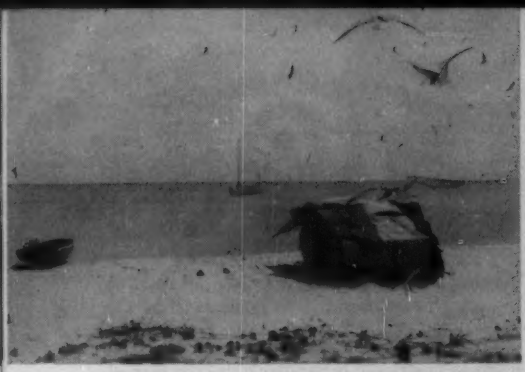


Fig. 7—Circuit of the antenna coupler with series-parallel tuning feature added. C_1L_1—Original AC-1 capacitor and inductance. S_1—D.p.d.t. switch.



Left: In the background the *Yasme II*, in the right foreground the "shack" (which seems to be aptly named in this case), and to the left is the dinghy and kicker. And everywhere, birds. Right: Aves Island (the English equivalent of which is Bird Island) is a bird sanctuary. As you can see from this picture, there are many, many birds present. Danny says that when gazing at the stars it is a good idea to keep your mouth closed.

YASME II to Aves Island

BY DANNY WEIL,* VP2VB, YVØAB

THE suggestion that I go to Aves Island and operate wasn't greeted with very much enthusiasm when I found out a few things about the island.

Even the fact that I would be accompanied by three other hams (Jules, KP4AIO, Julio, YV3BS, and Falke, YV5GO, were my companions and assistants both on the voyage and operations ashore) made little difference in my attitude. It was also brought to my attention, forcibly, that this was the hurricane season (July to October) . . . well!

I went over and visited retired Air Force Colonel Henry, KV4BZ, who lives aboard his converted sub-chaser at Yacht Haven, St. Thomas, and who has sailed extensively in these waters. I listened to his opinions and we looked at the charts. At first he had difficulty finding a chart with Aves on it but finally he found a large one with an inset of Aves. I felt even worse about the deal!

I have had the job of finding tiny islands, but never anything like this. It is 1500 feet long and 150 feet wide, maybe. Its height was a moot point, but somehow I couldn't get the colonel to raise it much more than six feet above sea level.

The colonel had been to Aves the year before. He had been attracted by a column of smoke and, upon going ashore, discovered two natives and a white man who had been there 42 days and who were almost dead. Apparently a fishing schooner had set them ashore for turtle hunting, a gale had come up and the schooner had to get out fast. The schooner either got sunk or just forgot about the men — no one seems to know — but that was the last the men saw of it. The poor blighters were on the last of their water and must have had a heck of a time with nothing to keep them company other than birds, turtles and crabs. No water is available on Aves nor are there any trees.

Dick, KV4AA, had spent several days constructing a cabinet that would house the HT-32, HT-33 and SX-101 so that it was completely self-contained and could be bolted to a prepared spot on *Yasme* and then unbolted and taken ashore. It was built like a battleship, and weighed like one too, but we both knew it would stand all the bashing I could give it without falling apart and so was good protection for the equipment.

Food was another problem. I have only had myself to cater for in the past, and to please three others was a problem. After all, maybe they wouldn't like my homemade bread which needed a hacksaw to cut it, and perhaps canned Spam with a fine rich kerosene flavor wouldn't be to their taste. Anyway, with the aid of Dick's XYL, I finally got a load of chow which should have satisfied anyone.

Stowing it was the next problem. Every cupboard was full of hardware, etc., but as eggs and bread weather none too well on deck, I had to move my ropes and wire to other places. We had found a refrigerator to stick aboard and that helped considerably. At least, we did have fresh meat daily and the butter was in one piece instead of being a gooey mess. A supply of cokes filled the refrigerator to capacity.

I was a bit worried about water. My tank only holds 30 gallons, so a general round-up was made here for spare bottles to augment the supply. My main tank also is a little rusty inside and every cup of water is flavored with ¼ cup of rust. I didn't mind it, but the other guys complained — some people are never satisfied!

KV4BZ had fixed me up with all the charts required for the trip. Many were never used, but I

* c/o Richard C. Spenceley, KV4AA, Box 403, Charlotte Amalie, St. Thomas, Virgin Islands

thought it might be a good idea to have others in the event of my missing the island altogether which, incidentally, I thought I would.

Seemed to me we had everything except good weather, but I'm getting so used to bad weather now that to have a really fine day for sailing would startle me! The usual customs and immigration formalities being taken care of we shoved off from St. Thomas at 3 P.M. on July 3.

I had a final check on all the gear as we stooged around in St. Thomas harbor. Two Onan generators, two SX-101, two HT-32, HT33, stacks of tubes etc. and countless feet of wire of assorted sizes. Everything seemed to be there and I chased the lads around to make sure they had lashed everything down. They just didn't know what was coming, and neither did I!

Clearing the harbor, I laid course for St. Croix, forty miles to the south. Severe cross seas and a 30-knot beam wind made the trip to St. Croix fast and rough.

Fredericksted, St. Croix, was flat calm and very quiet when we arrived at midnight. A soft glow came from the lights ashore and, apart from the rattle of the anchor chain as we dropped the hook, nothing broke the silence. We just couldn't believe that only 15 minutes ago we had been in ten-foot seas with a howling wind and all their attendant discomforts.

Early the next morning (I guess it must have been around 7 A.M.,) I stuck my neck out and looked around. As per the night before, everything was serene and calm and I really thought we should have a pleasant voyage.

With breakfast out of the way, we spent a while picking up assorted bits of gear, clothing, etc. which had fallen in odd spots during our short passage. Never did I realize that so many things could hide in so many obscure places. By 10 A.M. we were underway, out into a half-gale and heavy seas.

Right through the day and night *Yasme* plunged on, the auto pilot holding her to a course which none of us could have maintained for any length of time. Sea sickness had taken its toll from each and everyone of us and, to put it nicely, we all wished the boat would sink and put us out of our misery. Julio and Falke slept through the worst of it. Boy! they must have had cast-iron stomachs!

Another day dawned and we checked the log trailing astern. The sun was hidden by heavy overcast while we listened to our weather net friends, at 7 A.M., telling us the weather was wonderful. 10 A.M. came along, as usual, and with it a hazy sun poked its way through the murk to shine on 20-foot seas. Somehow I wedged myself on the cabin top and took sights. Jules stayed in the shelter of the doghouse, noting down times and angles as I called them out. I guess I must have taken about eight sights before the sun decided to quit again. I knew these sights would only give me a position line but even that would be welcome. I never did get any sights at noon but, with those already taken, I figured Aves was still about 70 miles away.

After a night's close watch on the depth finder the morning dawned dry but windy with seas breaking over the boat and giving us our usual ducking via the leaks in the hatches. Somehow we managed to keep the rigs dry. At 8 A.M. with a fairly clear sky Jules stood by while I took repeated shots of the sun. Further sights taken at 10 A.M. gave me a position 12 miles off course. A final check at noon would finalize my latitude.

Old Sol climbed to his highest perch and then climbed down again but I grabbed his angle before the clouds finally crowded in. I rushed below and within ten minutes had our first set of sights worked out. Not satisfied with this, I worked out another, and yet another. All of them tallied within a half mile and gave us an exact position. I told the lads my new course, set it and then said, with tongue in cheek, "Aves will come up, dead ahead, two hours from now."

The first hour went by with maddening slowness and the log read five miles more. Aves should be visible now, only four miles off, but it wasn't. I lugged out the binoculars and strained my eyes but no Aves. Each of the boys had grouped themselves by the bow and on the cabin roof but still no Aves.

There was nothing to do now but to climb the mast and make absolutely sure. It had to be there!

At first I wasn't sure. I called down to the lads "Either that is Aves dead ahead or I'm crazy." It *was* Aves. All that could be seen was a faint

This is the main operating position aboard the *Yasme II*, showing the equipment cabinet which is unbolted and taken ashore at most stops. The operator sits on the diesel engine housing.

Jules, KP4AIO, knocks off the contacts as Danny watches. Canvas shack, Hallicrafters gear in the background, beaucoup sand underfoot.

sandy smudge on the horizon which would appear and disappear as the *Yasme* rose and fell in the high seas.

With the depth finder flat out we crept in as close as possible to the beach and away went the anchor. Directly the way was off the boat she started to roll. It gradually built up so that the bubble in the inclinometer hit the side of the tube at 45 degrees.

From what we could see of the island it consisted of a low sandy strip with rocks on the lea shore and a steeply sloping sandy beach on the windward. Big breakers crashed over the rocks on the far side, but here on the so-called lea of the island, a cross sea built up as the waves swept around each side of the island and met directly at the point of our anchorage.

There was a native schooner anchored nearby, which had come from St. Lucia on a turtle hunt. It had already been there ten days with little luck, having only nabbed four turtles. The skipper came aboard the *Yasme* and advised friends in St. Lucia, via VP2LB, of his whereabouts. As it was getting late in the afternoon I decided I would reconnoiter in the morning and prayed for a calm.

At 7 A.M. we were all up and put the dinghy over the side. Ignoring the three fenders I had put there, it immediately scored the topside paint and started bashing itself to pieces. I managed to jump into it and shove it clear of *Yasme*. I then rowed over to the schooner and, with the help of three of its crew, managed to get aboard without wrecking the dinghy or drowning myself.

The schooner's skipper was a typical Frenchman and told me of the hazards of the place. I didn't need much convincing. He said that the weather had been bad all the time and it was with great difficulty that he had been able to get his turtles aboard, even with six strong men to handle his boat. It was then that I realized it wasn't going to be an easy matter to get our equipment ashore without losing or damaging it.

I then invited him over to the *Yasme* and after a cold beer (several, in fact) he offered to help us with the gear using his own dinghy and crew.

I won't go into details about the agonies of extracting the equipment from the interior of the *Yasme* and getting it on deck. Nor the trouble of lowering it over the side into his boat. Can anyone imagine loading stuff in a dinghy when at one moment it is level with the deck and the next second ten feet below it!

The SX-101 and HT-32 were man-handled into the boat but the Onan 1500-watt generator was too much and I decided to use the winch and my dinghy davit to lower it. Directly that thing left the deck and became suspended in mid-air it turned itself from a harmless generator into a 200-pound lethal weapon. Four of us struggled on the heaving deck to control it. With attempts to keep from falling overboard plus trying to avoid being smacked with the swinging generator, or letting it hit the boat, we finally got it into the dinghy. Now came the business of getting it ashore.

Those St. Lucia boys really knew their business though. We waited just outside the line of surf for the opportune moment and then they really bent their oars and went full out for the beach. Within fifteen feet of the shore line two of them jumped out into waist-high water and grabbed the boat, and as the next sea swept in, the rest of the crew jumped out and manhandled the boat up on the beach using each successive surf to assist them.

I helped carry the gear above the water line and we all shoved off back to the boat for the next load. Within three hours we had all the gear ashore except the HT-33 amplifier and I decided that the risk involved was too much to even attempt lowering it over the side let alone getting it ashore. Hovering in the back of my mind was the thought that all this gear eventually would have to be brought back to the *Yasme* without their help. I was glad of my decision later.

Up to this point I have made little mention of the island other than its general appearance physically. The first thing that struck us were the birds. Never in my life have I seen so many birds in one place. The island was literally blanketed with them and one had to step carefully to avoid either stepping on the grown birds, the chicks or the eggs.

As we moved our equipment to a reasonably clear spot, the birds would scare into the air screaming vengeance, and one would have to wave his arms to prevent them from attacking. We could stand over one of the birds, as it protected its eggs, and it would do nothing but scream and plunge its sharp long beak at us.

Jules set up the couple of pup-tents he had brought along and while they gave good protection from the rain and wind they were hardly suitable for holding all the rigs and still give room to operate. However we were mighty anxious to put YVØAA/YVØAB on the air and very soon we had the HT-32 ready to go.

During the 1958 Aves expedition a new 40-foot metal mast had been erected with a large metal Venezuelan flag mounted at its peak. This was to be our antenna mast. Aboard we had a selec-

(*Continued on page 198*)

The Perils of Six Meters

BY ROBERT SEALS *, K9AHK

IF YOU'RE not careful these days on 6 meters, you're likely to run across a QSO that sounds something like this:

1st Lid: Hey, man, you get a real strong signal here — I'd say 'bout 20 db. over S-9 — but boy, your modulation is a *mess!* Sounds like you must have some kinda trouble over there. You better check that, wot say? Break break break.

2nd Lid: Break break break. Ain't nothing wrong with my audio. You just ain't got me tuned in right. I'm using phrase modulation. You gotta tune me in off at one side. Howsit sound now? Break break break.

1st Lid: Break break break. Oh, I gotcha now. Fine business. Well, I got one of them new Globe Scout 680's and they use hydrogen modulation. But I don't use that just by itself — I got me a WRL lineal amplifier the other day. Howsit sound over there? Break break break.

2nd Lid: Break break break. Oh, man, you got a real fine business signal over here. I don't have an S-meter here but I'd say your signal was about 60 db. over S-9. I'm using a Gonset barefooted, and they don't have S-meters. Say, I thought about getting one of them lineal amplifiers but they tell me they get pretty hot and I couldn't figger out how to mount one of them fans to take care of the heat participation. Whatchou using for a receiver over there? Break break break.

1st Lid: Break break break. Receiver here is one of them war surplus Commando sets. It ain't got a S-meter on it either but you're a good S-9 (*He just found out that Gonset is barefoot, so he's revising his signal report* — ED.). Yeah, you got a good solid signal here. Whatchou using for an antenna over there? Break break break.

2nd Lid: Break break break. I got one of them three-element tellerex beams with a grammar match. By the way, your signal seemed to drop off on that last transmission (*He's burning over that S-9 report* — ED.). What kinda antenna you using over there? Break break break.

1st Lid: Break break break. I'm using one of them all-band wisdom antennas and it seems to be doing a pretty job for me here. Well, old man, your signal was pretty far down in the mud on that last transmission, too. I guess the ground wave ain't working too good tonight (*They're a half a mile apart* — ED.). So I guess I better say the very best of 73s and it's been a real fine business QSO. So the very best of 73s and hope to work you on the band again in the very near future. 73s, old man.

2nd Lid: Fine business, old man, and the very best of 73s to you, too. It's been real fine working you and hope to see you around the band in the very near future. So the very best of 73s and lots of good luck. 73.

1st Lid: Fine business, old man. 73s and I'll be seeing you. 73.

2nd Lid: O.K., ole buddy. 73 and I'll be seeing you. 73.

(ED. NOTE: *If you aren't completely numb by this time, you reach over and turn the dial as the 73s go ping-ponging back and forth far, far into the night.*)

* 1922 Sedgwick Street, Chicago, Illinois.

Strays

K9KIM suggests that we'd all be interested in an inexpensive stamp dispenser for coiled stamps, now available for about a nickel from the Post Office Department. It holds a coil of 100 stamps, which feed out through a slot in the side. Real handy for those who QSL.

BY DAVID B. FELL,* W3TN

Originating Message Traffic

Some Ideas on Traffic Sources

SOMEBODY has to originate traffic, else we shall *all* report QRU: "I have nothing for you." As it is now, far too many of us reporting into the section nets, night after night, come empty handed. Fortunately for those who bring no traffic, there are relaying and delivery assignments to engage a few, but not all. The services of these men are needed and most welcome. But it saddens the net control station to hold any man idle on a dull evening and finally dismiss him with nothing to show for his time.

The purpose of this article is to encourage the fullest possible participation in your ARRL section's net sessions. A good way to begin is to bring a message. One message originated by each reporting station would be healthier for the net and more fun for everyone than a big load from just one station.

You may think that message origination is not for you. You live in an isolated rural district. Your work is of a solitary sort and you are denied daily contacts with a variety of people in offices and in cities. Or perhaps you feel that you can't originate anything *important* enough. That touches the delicate matter of message content. What *is* this stuff we handle? Is it worth doing? The answer is a solid *yes*. It is not for us alone to decide the worth of a message. To be sure, the thrill of handling priority traffic — especially emergency traffic — is something to remember, but it is the large, steady volume of routine messages which creates the vehicle that makes a network efficient in emergencies. That volume becomes the "carrier wave" on which emergency traffic may ride. And when emergencies do arise, it will be the regular traffic nets that will be most ready and able to handle them.

Well then, how may we begin? Let us list some general types of messages. There are the "occasional" greetings: Christmas, Easter, Mother's Day, Thanksgiving Day, Valentine's Day. There are personal greetings for birthdays, anniversaries, birth announcements and messages to convalescents; congratulatory messages to nieces for making the honor roll, to kid cousins for getting their Wolf badges in Cub Scouts; to winners of contests and competitions; and to those elected to membership or to offices in business, social and civic organizations. There are acknowledgements of receipt of letters, packages, gifts and there are inquiries concerning the receipt of these, too. There are inquiries and notifications about safe arrivals and planned departures of travelers. There are notices of moves to new addresses. There are replies or acknowledgements indicated by the texts of the messages which we have just delivered locally. And within the framework of ham radio itself there are messages of proposed schedules for time and frequency for QSOs and of confirmation of the same. Surely, with all these kinds of messages and more, let no one admit that he can't originate traffic.

With all these kinds of messages in mind, who then will become the sources and the senders? I suggest we start at home, in our own households; next with those friends who have shown some sympathetic interest or curiosity in our hobby and with any neighbors whom we have not irrevocably alienated by TVI. Indeed, through message soliciting I have converted one neighbor who suffered from aggravated TVI into a fair traffic client. And, finally, there are the larger groups we meet in school, at the office, and in the myriad other activities we have. Even my barber (I am his captive and he is mine for twenty minutes on Saturdays) is a message client.

So it appears that the only practical limits to our sources for traffic are the degree of enthusiasm and alertness we bring to the task and the amount of time we give to it.

How shall we go about asking for a message? Tell your prospect simply and enthusiastically what we do in our hobby. It is a hobby of service. Tell him how it works. He may have read about

* 7818 Stratford Road, Bethesda, Md.

the marvels of radio contact with Antarctica, but he has no concept of *nets* and the National Traffic System. Tell him that, even if we might contact a "ham" in Salt Lake City, Utah, or Bennington, Vt., who would accept and deliver his message directly, we can make a more dependable delivery and a more orderly one through the net structure, because this is a vast cooperative enterprise of hundreds of devoted amateurs.

Explain, too, the breadth of our coverage: all of the United States, Canada, Alaska, Hawaii, Canal Zone, Puerto Rico, and military personnel in certain overseas places. Also, for the local and regional net, point out that we can frequently make a quick delivery into towns that we know are regularly represented on the nets.

Make clear to him the probable delivery time in order that he won't expect the improbable and in order to plan far enough ahead on holiday traffic. Suggest the general types of messages we handle; perhaps one of the types listed above may move him to try us out. Demonstrate by your own discretion in not disclosing the content of other people's messages that he can trust you with his own.

When necessary, explain to him that there are some kinds of messages we seek to avoid: debt dunning, fund raising, excessive statements of affection, and critical fault finding. However justified such messages may be, they do not belong on the air. They put the amateur at the delivery end in a very uncomfortable position. In that same connection we should be very chary in originating traffic ourselves, or in accepting from others, for origination by us, messages for fund solicitation, mass appeals for legislative or organized action, or for commercial purposes. None of us wants to be "used." Consideration for our fellow traffic man who has to relay or deliver such material should be our guide.

Let us suppose then that our prospective sender agrees to try us out. More often than you'd expect, he will say: "All right, but what shall I say?" Here you can offer good help in message drafting. Tell him this is a message, not a letter. Keep the text as brief as full understanding will allow. Because the message will usually be telephoned at the delivery end, the phone number should be included if known. Urge the use of simple straight-forward language; avoid veiled allusions and those private expressions that may carry great significance betwixt lovers or within the bosom of a family group, but which become open invitations for garbling in retransmission over a net. Encourage the use of

ARRL stock messages for holiday greetings for brevity's sake.

And now that you have a client, treat him right. Follow up. After an appropriate interval of time, make it your practice to inquire about the fate of the message. Was it received? This is important. For on the outcome of it depends whether or not you can convert a casual first-time message sender into a steady client. So you see how important prompt, careful delivery becomes to the originating station. Perhaps you yourself have followed up only to have him say: "I don't know. He didn't mention it in his letter." And that is where the value of written confirmations of deliveries comes in.

Promptness and accuracy in delivery are not the only things important to the originating station. The very fact of delivery itself is all-essential. If the message is undeliverable, for the love of ham radio send a service message back to the originating station and report. There's no quicker way of killing amateur traffic than not completing deliveries. For thus are dashed to earth the splendid hopes of sender and originating station alike. Even in such instances as non-deliveries you can sometimes win the sender back into the fold by asking him if he will let you send a follow-up inquiry about the first one, requesting an answer.

Finally, after a while you will have built up a list of fairly dependable sources for traffic. Contact them frequently. Your very re-appearance itself will suggest to them some message they could send. Also, look over last year's originations for the corresponding month (you probably will be cleaning them out of your files next month anyway). From these you may seek repeat birthday and anniversary greetings.

Here then is the point and conclusion: you too can originate messages. The suggestions above have worked for me. You will find still other ways and other sources. So come on in and when you can, bring a message with you.

Editor's Note: Another article by W3TN on delivering traffic will appear in a subsequent issue.

Strays

The December schedule for the Army MARS sideband technical net is as follows:

Dec. 3 — International Radio Communication Systems.
Dec. 10 — F. M. Multiplex Stereo System.
Dec. 17 — V.H.F. Radio Propagation.
Dec. 24/31 — No net sessions.

Correcting a previous report (see p. 184, Nov. *QST*), these 2100 sessions *and* the fundamentals lectures will be on 4030 kc. sideband.

From Pole to Pole on 40 Watts

BY
REV. DANIEL LINEHAN, S. J.,* W1HWK

The Reverend Daniel Linehan, S.J., is director of Weston Observatory, Weston, Mass., and is also chairman of the Department of Geophysics at Boston College.

Father Dan's field work has taken him to many parts of the world. In 1951–52 he operated geophysical surveys thirty feet beneath the Basilica of St. Peter's in Rome to determine how much of this was natural earth and how much had been placed there by man some twenty centuries ago. This study was to assist the archaeologists in locating the Tomb of Saint Peter.

In 1954 he went to the North Polar area and made some of the first measurements on the ground to locate the new position of the North Magnetic Pole. During this trip, he travelled some 8000 miles on a 70-foot vessel, doubling in brass as radio operator.

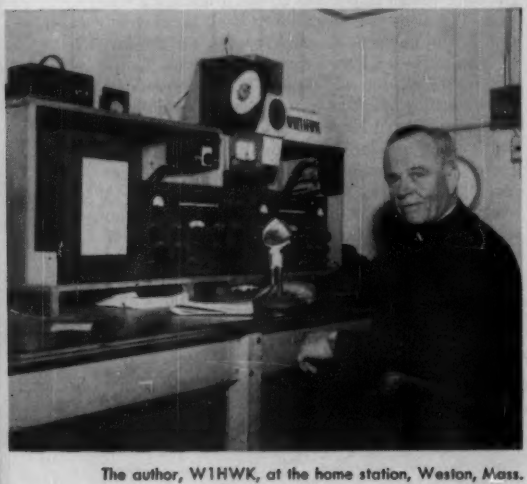
He has made three trips to the Antarctic as a consulting geophysicist for the U. S. Navy. His work in Antarctica included measuring the thickness of the ice at possible camp sites, and also measuring the thickness of the ice at the South Pole. His work at KC4USC was of a geophysical nature; to determine the amount of weathered rock that could be removed by bulldozers and how much had to be blasted.

He built his first receiving set in 1916 using the ubiquitous Quaker Oats boxes for the loose couplers. World War I closed him down, and subsequent duties ruled out ham activies for many years. Only in recent years has he managed to get back on the air.

Most of the articles that have appeared during the past year or so on the IGY and the U. S. Navy bases in Antarctica have mentioned the activity of amateur radio on that continent. Most of the installations operate 1-kw. sets suitable for maintaining fairly constant contact with the United States and permitting the men in Antarctica to talk with their families and friends. The one exception to this power rating in the past year was KC4USC which transmitted on 50 watts c.w. and about 40 watts a.m. phone.

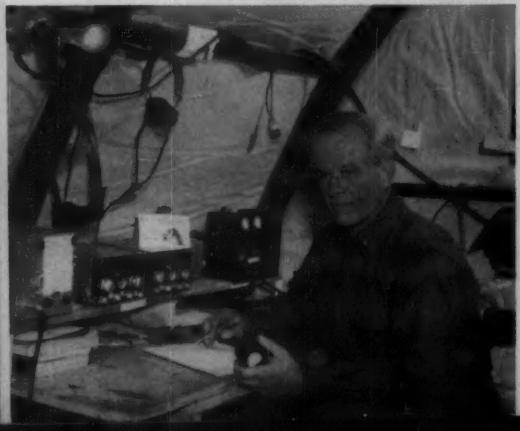
KC4USC was not at an IGY base, but during the winter of 1957–58 the U. S. Navy maintained a complement of 21 members of the Construction Battalion Reconnaissance Unit (Sea Bees) and six civilians who were engaged in special studies at a site at McMurdo Sound, Antarctica. Due to the mobility of this group, no heavy amateur radio equipment was provided for, so the writer brought along personal mobile gear normally mounted in a station wagon. There was doubt in the minds of many as to whether or not this power would get very far from Antarctica. We were in for a surprise!

*319 Concord Rd., Weston, Mass.



The author, W1HWK, at the home station, Weston, Mass.

The shack at KC4USC and operator W1HWK.



Our first contact was W4VEI/KC4. At first Bob really doubted if we existed, especially an a.m. station in Antarctica. He was about 900 miles from us at the time. A couple of hours later, W7SXP, Don, from Mesa, Arizona, copied us moderately well. At that moment we felt like Marconi must have felt when his first signal came through, but soon we became disappointed by the lack of response to our CQs and the "no acceptance" when we answered someone else. Then came the dawn (excuse me, "Don"!)

One of the more geometrically minded members of our party, Don Ball, began cutting out

pieces of paper to form great circle bearings; weather balloons were borrowed from the aerologist and covered with crayon marks; formulae from every book that could be found were appealed to; and finally we were convinced that the bearing of our beam could not have been worse if we had pointed it straight into the ground and covered it with damp earth. When we finally changed our bearing from 11° to something in the order of 120°, we heard more American stations and fewer Chinese. We went to work about the second week in January.

During the last three weeks of January, 1958, that we operated with this new bearing, we completed over 115 phone contacts; we transmitted some 50 messages and received 30 or more. We were able to copy traffic for KC4USV which was down at the time, and the messages could be delivered by helicopter pilots who flew to us now and then from that base about 50 miles away. Because of camp activities we were limited to about three operating hours a day.

One night the big thrill came when we heard a CQ from KL7FLA, an Ice Survey Station 312 miles from the North Pole. I looked at Marion Smith, our radio man 1st class, and said, "Shall we give him a try?" Smitty's doubtful and shrugging response was "What can we lose?" When Vern came back with the statement that we were "coming in loud and clear", we sat back for a nice QSO from Pole to Pole on 40 watts. Vern even conducted some third party traffic with a mutual friend, Father Cunningham, S.J., a veteran missionary in Alaska. After a contact like that, one sits back and complacently realizes that there are no more worlds to conquer.

Our radio equipment consisted of a Gonset G-66B receiver and a G-77 transmitter. The receiver worked from the 115 volts supplied by the camp generator, and the transmitter was fed by a 12-volt battery. We kept this latter at peak voltage with a power supply built by W1DTA before we left the States. The main asset, however, in utilizing all of the available power was the beam. Telrex of Asbury Park, New Jersey, built a two-element beam for us which was tuned for 14.25 Mc. It was a full sized 2-element Yagi with a gain of 5.5. db. The coaxial feedline ran through the main boom, which not only kept it away from the driver, but gave us a mechanical means for turning the beam when required — the way a farmer steers a cow.

Our camp location was one of the few places within 800 miles of the South Pole that is free of ice and snow during the Antarctic summer. There is the floating pack of ice of McMurdo Sound to the east and a few hundred yards to the west is the Wilson Piedmont Glacier. Beneath our feet was weathered rock and glacial deposits. Our first "tower" was built from scraps of wood salvaged from packing crates and we attained the magnificent height of 14 feet off the ground. However, this structure went over in the first 30-knot gust that came along. The beam was

20-meter beam at KC4USC, Marble Point, Antarctica.

bent a little in the fall, and although its symmetrical beauty was marred, its transmission properties were undamaged. The next support consisted of odds and ends of iron pipe and aluminum tubing inserted in an old packing crate and guyed with stray pieces of rope and twine. The beam was twenty feet high! It was not a thing of beauty, but withstood winds up to 40 knots, and while it swung crazily like a weather vane, it stood erect, or nearly so. We tried a folded dipole on 15 meters and another on 10 meters, but the results were not as gratifying.

Most of our reception was on s.s.b. while all of the transmission was on a.m. The G-66B afforded an excellent s.s.b. reception, although we had to keep retuning during a contact. This was not because of the receiver, but to the vagrancies of the generator. On battery operation, it would hold a station, but we did not have enough batteries for this type of supply.

Many are responsible for the success of our station operation, too many to thank by name. Jerry Kelliher, W1DTA, prepared the power supply and tested the gear before it left the States; Mike Ercolino, W2BDS, of Telrex built and donated the 20 meter beam; Don Ball, the engineer, who finally convinced us we were looking in the wrong direction (but who could imagine that Boston was southeast of Antarctica!); and the many Sea Bees who did everything but hold the beam in the air with their bare hands that we might keep going. Stateside, we are grateful to the many hams from the east coast to the west coast who listened to our a.m. signal whining on their s.s.b. sets. Many labored to catch us when they might have been listening to a nice crisp signal belted out from a 1-kw. rig.

(*Continued on page 204*)

YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

ONE HAM'S NIGHT BEFORE CHRISTMAS

(With apologies to Clement C. Moore)

'Twas the night before Christmas when all through the house
Not a creature was stirring, not even a mouse.
The rig was tuned up with the greatest of care
In hopes that the station I sought would be there.
My hubby was nestled all snug in his bed
But visions of rare DX danced through my head.
When out of the speaker there came such a splatter
I sprang to the dial to see what was the matter.

Away to the Collins I flew like a flash
And threw in the filter to cut down the hash.
With both gains turned back as far as they'd go,
I waited to see if his call I would know.
When what to my wondering ear should appear
But "MC2U, Mobile", solid and clear.
What a jolly old signal! I seroed him quick,
But I felt in my heart that it must be a trick.

In the many long years I had been in the game
I had ne'er worked a station with such an odd name.
I had contacted Danzig and Paris — Bombay
And some little village in Paraguay.
The QSL cards fairly covered the wall,
But MC2U would be rarest of all.
At last he stopped calling, 'twas time to let fly.
If I messed this one up, I was sure I would die.
With quivering lips and shaking knees too,
I reached out my hand and the plate switch I threw.

And then, in a twinkling, I heard overhead
A racket, enough to awaken the dead.
My plate current jumped and the meters swung round,
And down the chimney St. Nicholas came with a bound.
He was dressed all in fur from his head to his foot
And his clothes were all covered with tarnish and soot.
A stump of a pipe he held tight in his teeth
And something encircled his head like a wreath.

It circled his chest and 'is little round belly
Like a meat-ball surrounded by vermicelli.

It seemed rather strange, this peculiar attire.
Oh no! Could it be? My antenna wire!!!
He held up a feeder, the jolly old elf,
And we laughed till we cried, old St. Nick and myself.
Then, laying a finger aside of his nose
And giving a nod, up the chimney he rose.
As I watched from the window, he went straight to work,
And, in no time at all, he turned with a jerk.
And there on the roof, standing sturdy and tall
Was a beautiful beam, with rotator and all!

As my eyes filled with tears that longed to be shed,
He peeked in the window and waggled his head.
"Don't thank me, my sweet, it's the least I can do
'Cause you see, dear YL, I'm an amateur too!"
Then he sprang to his sleigh, to his team gave a whistle,
And away they all flew like the down of a thistle.
And then, from the speaker, his voice, loud and clear,
"Do you know what my call letters stand for, my dear?"
His voice became dim as he faded from sight.
"M for Merry — C, Christmas, and 2 U a good-night!"

— *VE3AJR*

WHOOT members at the Dallas Women's Open Professional Golf Tournament: standing by at one of the tournament scoreboards are K5MTF, W5sBDB, SYL, KEC, and K5GMI. A high light of the activity for the YLs was the meeting of a number of national champion golfers.

Left: For fifteen-year-old KN1GUS, Phylli Zlotnick, and her twenty-year-old brother Sigh, W1NQL, ham radio is a means of traveling around while seated in their wheel chairs, for both have muscular dystrophy. Phyllis operates novice frequencies daily from her Portland, Connecticut, QTH. Right: At the National Convention in Washington last August, W1HAQ unexpectedly found herself operating K4NAA/3, the convention station, with a room full of old-timers kibitzing about her. Sixteen-year-old Marsha McCoy took it all in stride—maybe partly because she's the daughter of W1ICP of ARRL headquarters. Home at Granby, Conn., Marsha QSOs primarily on 10 meters.

A NEW COMBINATION

Ham radio "linked" to golf? Pardon the pun, but the Women Ham Operators of Texas provided the tie-in when they volunteered communications services for the annual Dallas Women's Open Professional Golf Tournament September 5–9th. Eleven WHOOT members, set-up at three locations on the Dallas Glen Lakes Country Club fairways, used two-meter Communicators to relay to golfers and spectators a hole-to-hole report on the score of competitors as they rounded the 18-hole course. Communications were organized by Eddie Aymond, W5UHV, a member of the Civitan Club of Dallas, sponsor of the tournament, which is played for the benefit of mentally retarded and deaf children in the area. OM W5UHV and YLs K5s GBX, GMI, IPE, KDY, MTF; W5s BDB, KEC, SPV, SYL, YKE; and KN5P8K were commended for their services in what proved to be a very successful communications project.

YL CLUB FD SCORES

Our thanks to W1YYM, Ellen, of headquarters for supplying the following tabulation of YL Club 1958 Field Day logs and scores (class A — field station). See page 46 in this issue for complete schedule of FD results and the

YLRL NETS AND ROUND TABLES

Phone Freq. Kc	Day	Time	NCS
3890	Monday	3:00 P.M. PST	W7HHH, alt. W7NJS
3970	"	10:00 A.M. CST	WØUDU, alts. WØBFW-WØPIK
3885	"	2:00 P.M. PST	W6KER, Southland YL Net
7225	"	9:00 A.M. EST	Floridora YLs (4th dist.)
7235	"	10:00 A.M. MST	WØTYB, Loaded Clothes Line
3838	Tues.	9:00 A.M. EST	WØKJZ, Pi-Net
3900	"	8:30 A.M. EST	K4CZP, Blue Ridge Net
29,000	"	1:00 P.M. EST	Hair Pin Net (No NCS*)
28,900	(1st Tues.)	9:00 P.M. EST	QRMary Round Table (each month)
3900	Wed.	8:30 A.M. EST	W1TRE, Yankee Lassies
3900	"	9:30 A.M. EST	W8ATB, Welcome Net
3915	"	9:00 A.M. PST	W6GQZ, Ironing Board Net
7280	"	2:00 P.M. CST	Acara Yls, Kansas (10th dist)
146.1 Mc.	"	7:00 P.M. PST	W6LBO, 2 meter YL Net
3880	Thurs.	8:00 A.M. CST	Texas YL Round Up Net
3985	"	9:00 A.M. EST	Georgia Peaches (4th dist.)
7235	"	10:00 A.M. CST	Texas YL Round Up Net
7215	"	9:00 A.M. EST	W3UUG, Friendly Forty
14,240	"	2:00 P.M. EST	Tangle Net (No NCS*)
7250	Friday	10:00 A.M. PST	W6QGX, YL Round Table
21,390	"	2:30 P.M. EST	KZ5VR, Cross Country

* These nets are operating on schedule with temporary Net Control Stations.

Please address inquiries regarding the above schedule of nets and round tables, which have been registered with the YLRL for the 1958–59 term, directly to YLRL Vice President Kay Anderson, W4BLR, 5210 Raleigh Road, Richmond, Virginia.

September YL column for general summary of YL participation in the June 1958 FD.

Information as listed: call used, name of group, YL who submitted data, nr. of QSOs, power input (*A* under 30 watts, *B* 30 to 150 watts), nr. of participants, final score.

K5BJU/5 Gulf Area YL ARKlub (Gaylarks), Harriett, K5BJU, 559-B-10-3504

W6BDE/6 San Francisco YLRC, Esther, W6BDE, 211-AB-7-1572

K5QHI/5 Women Ham Operators of Texas (WHOOT), Bea, K5BNH, 215-B-9-1440

K5LZW/5 Women Ham Operators of Tarrant County, Inc. (WHO), Betty, W5ETH, 194-B-7-1320.

DXCC ADDITIONS

W1WPO of headquarters reports that since August the following YLs have been issued DXCC certificates: W3SKQ, W5EGD, KH6AUJ, KL7BHE (c.w. and phone) and W3GEN (phone only). KØACC should have been included in our annual listing of DXCC YLs, which appeared in the May 1958 column. Lola's certificate #1119 was dated 2/5/58, with all contacts on phone.

KEEPING UP WITH THE GIRLS

CLUBS:

N. Y. C. YLRL — welcomes all YLs in the N. Y. C. area to join with them for monthly meetings. Contact Lillian Byrne, K2JYZ, for details. At the September meeting Madeline, W2EEO, and Ruth, W2OWL, showed pictures taken at the last ARRL National Convention.

Los Angeles YLRC — At the first Fall meeting Martha, W6QYL, and her OM W6RDQ, showed slides and talked about their three-year stay in Beirut, Lebanon, where Martha operated as OD5CH.

Washington Area YLRC — met at the National Museum in September and elected the following officers: Pres. W3CDQ; V.P. W3RXJ; Secy. W3UTR; and Treas. W3UXU. K4LMB was appointed delegate to the Washington Foundation of Radio Clubs.

MISCELLANY:

OM W1HHR reports that the latest winner of the Willimantic Jaycees Worked All Connecticut award is W1YPH. Leona is the second YL winner in Massachusetts and the first YL to win the award using c.w. The W-Conn award is issued by the Willimantic Jr. Chamber of Commerce and is available to amateurs for contact with Connecticut's eight counties. Awards are presented at a formal meeting of the Jr. Chamber of Commerce chapter nearest to the applicant's city. . . . Mary, W6QPG, will operate from Wake Island in the YLRL A.P. and the YL-OM contest using her OM's call, KW6CQ, on 10, 15, 20 c.w. and 10 phone. . . . OM K8GHG reports that in addition to 8P5YL, 8P38Q is an active Polish YL (on 15 meters). Bob has worked YU1OE, Mica, of Yugoslavia, several times on 15 c.w. . . . Vada, W6CEE, Jean, K6OQD, and Pat, K6PFY, operated ham gear at the Los Angeles County Fair. . . . Meta, WV6BNS, keeps track of her seven grandchildren by daily skeds with her daughter Mary, W6MWU. . . . Dot, W4UF/W4ZKD, of Englewood and Gainesville, Florida, presented a paper on her research (blood parasites) at the Sixth International Congress of Tropical Medicine and Malaria in Lisbon, Portugal, in September. . . . For Ruth, W4BWR, and her OM installing mobile gear in their new 1958 Mercury was no labor at all — winning the car in a raffle made the work much easier. . . . OM W3YLL reported this tidbit — both Muriel, W1KDY, and Louise, W3WRE, have the last name of Moreau, but are not related. Muriel lives on Russell Street in Winooski, Vt. Louise lives on Russell Avenue in Johnstown, Pa. . . . During her stay at a Birmingham hospital K4TWN used a six-meter Communicator for many hours of pleasant QSOs, including skeds with her OM, who operated mobile. Ethel's doctors and nurses warned visitors that her illness was harmless but that the ham radio bug might be contagious.

Little Miss Kris Abney, KN4ZTX, of Falls Church, Virginia, operates 7169 kc., using a Globe Chief and an S53A. Kris' uncle, W6KNM, who submitted her photo, became W28ZB in 1929 at the age of twelve. Kris is all of eleven at the moment.

A junior at Hollywood High School, 15-year-old KN6RFV, Margo Glasser, has her own DX 40 and HQ110. Dad KN6RFU has his own rig too, but apart from hamming they both share musical interests. KN6RFU has scored the music for hundreds of motion pictures, television and radio shows.

Strays

Rules for the 4th WAE DX Contest have just been received from DL7AA, DX Manager of DARC. They are much the same as usual except that the phone portion has been dropped due to the small number of such entries in the first three holdings of the contest. Details on the c.w. section, coming up from 2100 GMT January 9 through 2100 GMT January 11, will appear in "How's DX?" next month. A self-addressed envelope sent to the DARC DX Bureau, Fuchsienweg 51, Berlin-Rudow, Germany, together with one IRC (airmail five IRCs) will bring score and summary sheets.

—···—

A whole raft of equipment was stolen during October from Bil Harrison's Jamaica store. Items and serial numbers are as follows: 32V-1 (283), 32V-3 (661), 32V-3 (297), HT-33 (158280), Viking II (5770), Pacemaker (16181), S-53A (56729), S-94 (172579), S-102 (95628), NC-300 (1926). Also taken was a quantity of hi-fi gear. A reward is being offered — contact Harrison Radio, 225 Greenwich St., New York 7. Telephone BArclay 7-7777.

—···—

ZS3JW says he has five hams in his family, and wonders if that is any sort of record.

—···—

If it's *results* you are after, call on *QST* — the stolen Communicator mentioned on page 10 in November has already been recovered. (The local hams did some excellent detective work.)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Whoa:

The searing sun sank low behind him, alkali haze settled like a shroud over the thirsty plains and Pecos Pete turned his imported cayuse toward the home corral where Sagging V wranglers gathered after a hard day's punchin'. Pete had a date tonight with Nepal Sal, a cute little number just in from the East, so he spurred on his nag at a gallop.

Git along, git along,
Git along little dogie . . .

After a splash of cool water and a pan of hot grub Pecos saddled up and headed for the Old 20 bar. He inspected his gun's loading near the door and swaggered in toward the low end where Nepal Sal already was singing sweet songs to the boys. Elbowing through the mob, he gave Sal a quick call and glared meanly around him. 'Pokes scattered to either side, a couple of dudes from New York almost swallowed their cigars, and a hush fell over the house. The admirers around Nepal Sal melted away. All except one — rough and tough young Howlin' Sam of the Double Diamond range. Sam hitched up his belt, whistled at Nepal Sal and returned the snarls of Pecos Pete. But Sal played hard to git.

It's all yore misfortune
And none o' my own . . .

Pecos Pete spat viciously, tossed off one more and then really lit out after Nepal Sal. But Howlin' Sam blocked his way. Old Sol behind the bar pleaded, "Now we don't want no trouble, boys," and hit the floor. Bystanders scrambled under tables or hightailed it out of range. The air was electric in the Old 20 now. Many a grizzled OT went plumb loco and bit off his pipe on the spot. Nepal Sal commenced another tantalizing tune with Pete and Sam all ripe to draw.

Mah patience is shot
And mah nerves are a-janglin' . . .

Sal cut off her song with a chirpy scream as Pecos Pete and Howlin' Sam grabbed for steel. Two blasts rang out together in the deepening dusk. Somebody laughed. Then somebody sobbed — the lights went out for Pecos Pete. Fickle Sal sashayed away to listen for Howlin' Sam's phone. Poor Pete crawled out of the shack and went downstairs to change fuses, bitterly knowing he was no longer top smoke in the West.

What:

And tomorrow the junkbox will be yore new home. . . . Well, Pecos Pete can always reach for more copper and try a comeback. Say, lots of DXcitement in the slots over the past few weeks. In the following band-samplings frequencies (in number of kilocycles above the lower band-limit) appear within parentheses. *E.g.*, (9) = 14,009 kc. if the paragraph treats 20-meter work. Times are GMT using the nearest whole-hour figure such as 7 for 0720, 0 for 2349. Thus in the ten-meter phone paragraph "HZ1AB (652) 15" indicates that HZ1AB has been observed using 28,652 kc. around 1500 GMT. Let's commence the conspectus. . . .

10 phone is a solid starting point for this month's "How's" Bandwagon and K9ELT sets the mood: "*Man*, what signals on 10 lately — nothing like it!" Contributors W1s KRS NTK, K1CBR, K2s AYC (now at 75/31 worked/confirmed), MHY (34 bagged), K3AMH/4, K4OAQ, W5KLB, W6ZZ*, W7VCB, W8s BMX (119/94), QAZ, K8CFU, K9s I8P JIN, KZ5US (a fast 55 worked) and VE3EIL collected **CN**s 2AX 8FJ, **CR6**CA, **CT2**AI, **CX**s 1BY 23, 1VD 2BT, **DU1**AP, **EA**s 6AS 8AH, **EL5**A, **FB8ZZ**, **GC3LXK**, **GD3**s FOC UB, **HC**s 1TM 2FF, **HK7**s AB LX, **HL9KT**, **HP**s 2MD 3FL 3RL, **HR2**s DK HA, **HZ1AB*** (652) 15, **IT1CD8**, **KA2YA**, **KB6BJ**, **KC4**s U8B* U8W, **KG4AU**, **KM6BL**, **KR6AF**, **KX6**s AF BP* (650), CG, **OA5F**, **OD5AB**, **OQ5**s FN TP, **OX3WE** 20, **OY4T**, **SV0WJ**, **TG7JD**, **UA0LA**, VE3BQL/**SU** (see "Whence" and "Where"), **VE8**s AB BB DW, **VK**s 6RU 9CP, **VP2**s 1JH 2LS 5CB 6EB 6JC 1, 6KM 6TR 9EF, **VQ9**s 1PBD 2DC 2MR 18, 4FK 5DM, **W**s 2EPS/**KJ6** 4GYX/**KM6**, YN4CB, **ZE**s 1JD 7JD 7JQ, **ZS3B** and **5A3TH**. Asterisks signify side-band stylists.

10 c.w. rolls out its red ionospheric carpet for all and sundry. "The band has been hotter than a ZD2 at noon," according to W1MEL. Agreement is registered by K2s AYC MHY, W3GYP, K3AMH/4 (80/57), W5KLB, K6QHC, W7QNI, W8s BMX CSK NOH, K8HTI, K9s ELT (67), GDQ I8P JIN and VE3BUR because of **CE1AD** (82) 17, **CR6**CK (22) 16, **CX2BT**, **DM2ACN**, **DU7SV** 100), **ET2VB** (20) 20, **FA8AN**, GB2SM just England,) **HA5DD** (38) 17, **IT1ZDA** (63) 18, **KB6BJ**, **KG4AZ**, **KP6AN**, **KZ5**s DE IF, **LA**s 1WF 2KD 9OD, **LX2GH**, **OE8KI** (75) 16, **SP**s 6FZ 7HX (110), **SV0**s WP (40) 20, WR (42) 14, **TF3SF**, **UA**s 1BE 2KAW (80), 4IF 6KOB, **UB5UW**, **UF6FB** (82) 16, **UQ2BA** (150) 15–16, **VK9DB**, **VP7BT**, **VQ5EK**, **VU2RM** 0, **XE**s 1AX 1YF 9NHD, **ZC4IK**, **ZD2JM** (60) 2, **ZE**s 1JV 7JY (44) 15, **4X4**s IK IO and IV.

15 phone is flippin', too. Reporters W1MEL, K1CCA (103/65), K2s IXP (129), MHY, W4ZSH, K4OAQ, W5KLB, W6s KG OJW ZZ*, W7VCB, W8s NOH YIN*, K9s G8G JIN, KØLEQ and VE3EIL give the word on **CE3RC**, **CN8**s AA EH EU, **CP**s 1AM 5EC, **CX1BY**, **EL2N** 2, **FS7RT***, **GC2AAO**, **HC1RY**, **HI2MC**, **HK4AQ** 3, **HL9KS**, **HP1**s LB VA, **HR2RH** 2–3, IT1CD8 3, YL **KA2HA**, **KC4**s U8K* U8V*, **KG4**s AU AZ*, **KX6BQ***, **KZ5**s AG KD, **MP4BCC** 12, **OE1DH** 20, **PJ2**s CE MC*,

*4822 West Berteau Avenue, Chicago 41, Ill.

SV9WT, TF2WDD (403) 23, TG9 7AB 22, 9RY 9US, TI2s galore, UF6FB, UQ2AN (216) 12, UR2AO, VE1ADE of P.E.I., VE8s HV MO SO TE, VPs 1EE 3, 2DJ 5AR 0, 5ER 6JC 6ZX 7BX 19, 9BN 9DM, VU2CT (205) 18, XE1s in number, XW8AH (15) 17, YS1s JM (409) 12, MM, ZB1s DC US USA, ZS8s 5DW* 6AQQ* 15 and various 4X4s.

15 c.w.'s full DX potential is being realized by W1s EQ KGH MEL (31/3), K1s CBR CCA, W2s ETU HMJ, K2s AYC IXP MHY UPD, W3LAX, W4s USM YOK, K4s IGD OAQ OTG PHY, W5KLB, K5KGF, W6s KG OJW ZZ, K6s QHC THZ, W7s DJU QNI VCB, W8s CSK NOH, K8HTI, W9s FNX (85/71), LNQ (125/115), K9s ELT GDQ GSG ISP JIN, K9s HGB JPL LEQ LFY, I1ER and VE3EIL who account for CE1AD, CN2s AQ BK (40), CN8s CC DJ FM GH MK, CR6s AI CK (50), CT1ID, CX8s 2BT (60), 5CO (62), DM2AEB, EA6AM, EL1K, ET2s KY US (30), FA9RW, FF8BF, FQ8AJ, GC3LXK, GD3FXN, HAs 5AM 5DH 5KBR 8WS, HC8GI (35), HP1SB, HV1CN, IS1s CXF MM, IT1s AA AGA ZDA (77), JAs 3IS 3TT 3UI 6OK 7AD, JT1YL, K6IGP/KP6 (37), KA2KS, KB6BJ, KM6BL, KR6JF, far-south LUs 1ZS (20), 2ZS (100), LZ1AH, OEs in concert, OA4s AGI FT, OY1R, PJ2s AL CJ ME (40), a dozen SPs, SL7BC just Sweden, ST2AR, SV9s WR WY, TF3s KG 8F, TG7AB, TI2s LA WR, UAs 1AU 1AS 2KAW 3BF 3CC 3HI 3KBR 6FQ 6KTB 6UF 9CM 9KQA 9OI 0CN, UB5s CK FG IO KCE KIA UW, UC2s AX BB CB KAB KAR, UF6FB, UN1AE, UO5AA, UQ2s AB AR AS BU, UR2KAE, VE8TO, VK0TC, VPs 7BT 7NA 8CR 9BO, curious VP8AB (40) 21, VQs 4EZ (20) 20, 5EK, VR2DG, VSs 1GL (40), 1GZ 6EE 9AS 9AT (60), XE9NHD (45) 21, XW8AH (20) 14, YOs 2CD 3AQ 3RI, YV5s DE GY (73) 18, HL, ZA1MA, ZB2A, ZC4s AM (15) 22, IK RP (20), ZDs 1FG (30), 7SA (45), ZEs 1JN 1JV 3JO, ZL5AC (40) of New Zealand's Antarctic, 4X4s CJ CK JT JU and 9G1CR.

15 Novice doings supply stuff like CE1AD, DU7SV, I1ER, JA4HM, KM6BJ, OK3KOT, PY4OD, SP9JA, TI2LA, VKs 3TF 3VJ 6EJ, WG6AHS, WH6s CNK COK, ZLs 1MT and 2AOV to the eager logs of KN1IMP, KN2HIY, KN3BUZ, KN6s EBL (one more continent to go for WAC), EBX and WV6BVR. The latter also managed KP4AOO on 40-meter code.

20 c.w., harassed by mountainous QRM as the result of phenomenally short skip, performed willingly for W1s KGH (150/126), MEL, K1s CBR CCA, W2s HMJ JBL, K2s AYC MHY UPD UYG, W3s GYP LOS (75/53), W4s FFF USM (113/80), ZSH, K4s IEX IGD OAQ PHY RPD, K5KGF, W6s FZH JQB KG ZZ (195), K6s CQF (121/67), ICS QHC SHJ, W7s DJU QNI VCB, W8s BMX CSK NOH YGR (125), K8ERU, W9FNX, K9s ELT JIN, K9s HGB JPL LFY (112/63), CE3AG, I1ER, VE3EGG (40) and VS1FJ. Delectables detectable include AC4AX (100) 12–14, AP2C (50) 3, BV1US, CEs 9AK (62) 5, 0AC (100) 20, CN2BK (37) 0, CN8s BF FV GD LC, CRs 6BX 6CK 7BC (60), CT2s AI BO, DMs 2ADB 2AQH 2AVN 3KCK 3KIB 3KKJ, DU7SV, EAs 6AM 8BK 8CP (40) 7, EL1X, ET2KY, FA8AN, FB8ZZ, FF8s AC/GN of the new state of Guinea, CC, FK8AS (10) 12, FP8AP, FQ8s AJ (44) 6, AP (85) 5, HA, FU8AE (80) 10, FY7YE (60), GCs 2FZC 3AAE 3HFE, GD3FBS, HAs in number, HCs 1HL 4IM, HKs 4JC (8) 3, 5CR 5SG (73), HL9KR (30), HP1VA, HRs 2FG 0AA (14), HV1CN (50) 21 as guest-operated, IS1ZUI (44) 1, IT1s AE AGA AQ ZDA (45), JT1AA, JZ0DA (20) 11, scads of JAs in all call areas, K2ILQ/KG6, K6IGP/KP6 (42), K6IZJ/KG6, KA2s KS RS, KB6BJ, KC4USV, KGs 1CJ (37) 1, 1DL (38) 2, 4AP, KM6s BK (15) 8–11, BL (48), KR6s EO QW RP, KSs 4AY 4AZ 6AG (75) 11, KV4s AA (80) 22–2, BO (20), KW6CU, KX6s BT (40), CJ CW (72), LZs 1DX 1KPC 2KDO 2KLR (81) 0, 2KSH, LUs 1ZE 1ZS 2ZS of the Argentine's antarctic proximity, MP4DAA, strange MT4TG (31) 2–3, OD5LX (25) 4, ON4s BQ and CK in Luxembourg, OQ5s EH PE (64) 22, Belgian antarctic-outposter OR4s OR VN (98) 3, OX3UD, OY7ML (52) 19, PY7AN/0 on Fernando de Noronha, PZ1s AG AM (45), AO AR, RAEM of Moscow, SL5s AX DE of the Swedish military, SV9WR, TI2s PZ WD WR, YL UA3RU, UA1KAE/3 of Russia's antarctic endeavor, UA2s KAR KAW, UA9s CM DN KCA KCC (58), KKC, UA0s FF FS IJ JB KAD KAR KDA KIA KJV KKD KQB KUV KZA (85) 12, OM RK, UB5s en masse, UC2s AF BB CB (30), KAR, UD6s BG FA (70) 1, UF6s AF FB (4) 0, UI8AK, UL7HB, UN1s AE (50) 5, KAB (1) 3, UO5PK (60) 5, UP2NM (28) 23, UQ2s AB AJ AO AN AS BM KAV (53), UR2s AO (30) 4, AT (5) 20, BU (5) 22, VE8s AB PB TO, VKs 9XK (35) 10, 0KT (40) 11–12, VPs 3AD (55) 2, 5AR 5BL 5LI 7NA 8BJ (31) 0–1, 8CR (10) 6, 8CY (85) 0, 9DM 9EP 9Y, VQs 2EW 2GW (38) 0, 3CF (85) 21, VR2s DA (86) 10, DG DK, VSs 1CZ 1FJ 1GB 1HU 1HX 1JF 6AE (55), 6CO 6DS 9AC (49), 9AT (51) 23, VU2RA, Ws 2EPS/KJ6 3ZJU/KP6 9HYM/KG6, XW8AI (38) 15, XZ2TH, a dozen YOs, YV5GO, ZBs 1NB (43) 21, 2A 2I (40) 4, 2R, ZCs 3AC (82) 12, 4CB (40) 15, ZDs 1FG (85) 4, 2DCP (55), 2JM (88), 7SA (50), 8JP, ZE1JV, ZK1BS, Chatham's ZL3DA, ZP5s AP AY (56) 2, 4X4s FN GB GY (52) 22, IO JU, 9G1CR, 9K2s AN AT (12) 3 and AU.

20 phone satisfied K1CCA, W4U8M, W6ZZ*, K6IC8, W8YIN*, K8CFU, VE1PQ* (44 on a.s.b.) and VS1FJ with the likes of BV1US, CN8MM*, EL4A (310) 21, GD3GMH* (308) 19, HC1AG* (303) 1, HL9KR, HV1CN (283), HZ1AB* (310) 0, KA2YA* (302) 10, KC4USA*, KG1s AJ* (293), FD*, KR6CP* (315) 9, KX6BP*, KZ5CN* (306), MP4BBW* (308) 2, OA4GB*, OH0NC* (305) 18, OK1MB* (305), PJs 2AA* 3AE (315) 4, TG9AD, VPs 1SD* (310), 5ER* (310) 23, VQs 4ERR* 5FS* (300) 19, VSs 2FJ (195) 14, 5AT 9MA*, VU2RM* (310), W3ZA/3W* (324) 14, YS1MM (302) 1, YV5EC, ZLs 1ABZ (315) of the Kermadecs, 3DA* (314) of Chatham, ZS3E* and 5A1TB* (308) 19. The little stars blink for a.s.b.ers.

40 c.w. gains momentum after a slow start this season. K2GJS declares, "Never thought 40 much good for anything but rag-chewing, QRM and QRN. But things are happening!" And W1VKZ remarks, "Hearing quite a few DX stations calling CQ without W/K replies. More of our gang should avail themselves of 7-Mc. possibilities." Those thoughts are shared by K2AYC, W3LAX, W4FFF, K4RWH, K5LZD, K6QHC, W7s DJU VCB, K8EEG, K9HGB and KP4AOO who hit the 7-Mc. bull's-eye for DM2XLO, EL1K, FA8EC, HC2ME, HP1TC, HR0AA, JAs 1BC 1BVS 2BP 2UW 3AMM/2 8IA, KA9PW, KC4USB, KX6BP, OE6KD, PJ2MF, PYs 6BQ 0CB of Fernando, SP9KAG (105) 3, UA9FS, UB5AZ, UC2KAB, VK9XK, VPs 2SH 5BL (3) 2, 7BT 0AB (again!), WH6s CKL COK, XE2BF, YO3FD, YUs 2IJ 2LP 3OS and break-of-dawn ZL/VKs. . . . . Forty phone's rag-chewers' monopoly was broken by KP4AOO in snagging HI8BE and PJ2MC. Say, *who's* working DX on eighty?

160 c.w. welcomes the 1958–'59 season's organized DX efforts as announced by W1BB, principal promulgator and protagonist: "The Transatlantic and World-Wide 160-Meter DX Tests will take place at 0500–0730 GMT on these Sunday mornings — December 7th and 21st, January 4th and 18th, February 8th and 15th. During those periods special efforts will be made to contact European, Asian, African and other 160-meter amateurs throughout the world. Working DX on 'top band' is challenging and extremely interesting. Interference by atmospherics, BC harmonics, loran, etc., calls for extreme patience, perseverance, a top-notch s ation and keen operating techniques.

Hams are where you find them, an ecological truism, and these landscapes are striking studies in DX environment. Left to right, this page and next: (1) A cleanly mounted cubical quad certainly does something for the Burgos villa of EA1GH. (2) That's ZD6JL's three-element beam and Blantyre back yard. (3) Polar bears get under foot at the Dickson Island diggings of UA0KAR and this one seems to be on the trail of a discarded pizza pie. (4) Lastly, we chance upon LA2JE/P enjoying his morning Hope Island, Svalbard, constitutional accompanied by some of Jack London's old cronies.
(Photos via Ws 6ITH, 6NXP, 9WHM and 1ICP)

An active group of British and other overseas amateurs, in cooperation with U. S. operators, are behind this effort, a yearly DX activity since 1932. All amateurs throughout the world of 160 are invited and urged to participate. There still are new 1.8-Mc. countries to work and 'firsts' to be made. Most W/K/VEs will operate in the 1800–1825-kc. segment while those in the West will use 1975–2000 kc. DX mainly will be found in the 1800–1875-kc. region, particularly 1800–1835 kc., but don't neglect 2000-kc. DX possibilities." W1BB recommends that W/K/VE stations call CQ DX TEST during the first five minutes of each hour, listen during the second 5-minute period, call for five more minutes, etc., until the DX ball starts rolling. Send reports of results and observations to W1BB and/or Jeeves & Co. — good luck and fine fishin'!

Where:

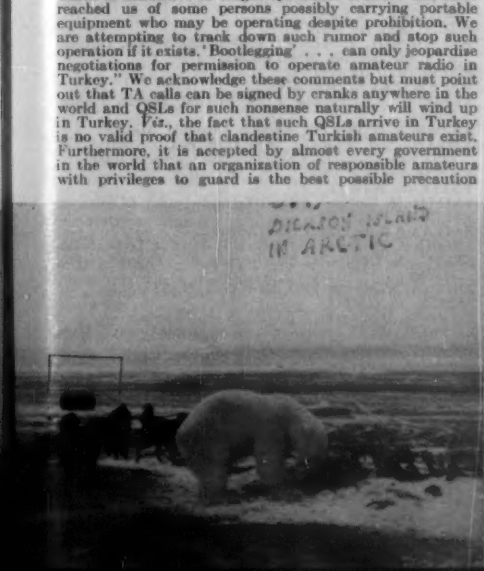
Asia — Concerning HZ1AB verifications we hear from W3IDU: "Anyone who did not receive a deserved HZ1AB card for the period February through April, 1958, can obtain one by forwarding a QSL or note with contact details. All cards so far received have been answered but, due to mail restrictions, malfunctions and other reasons, I feel that many cards destined for me were not received. All applicants will be answered promptly and 100 per cent." More on the same subject from K2SGO: "As of this November I am handling all QSLs for HZ1AB. Those desiring direct replies must submit stamped self-addressed envelopes. Others will go via bureaus in answer to cards as received. I receive logs from HZ1AB monthly." Bob's offer is good only to amateurs in the U. S., its possessions, and Canada. . . . . V82DQ, a Malaya mainstay, will be holidaying in the U.K. till April of next year. James can be reached c/o Westminster Bank Ltd., Town Hall Sq., Bexhill-on-Sea, Sussex, England, in the interim. . . . . Regarding JT1 confirmation assistance OK1JX confides to W8DAW: "I had to stop all this QSL business for quite a while because of my job. Please excuse the delay, you and the other boys." . . . . . From Maldives' munificent VS9MA courtesy ex-487DT and W1WPO: "Our first pack of QSLs to the States left around mid-August. At this date all cards to W/Ks have been cleared, those for bureaus by sea. At the moment we have no cards left, and the scarcity of QSL stock disinclines us to send repeats by air in return for cards sent to us direct with IRCs, etc." . . . . . "OD5BZ is permanently off the air," reports the man himself, W8BKO. "Fortunately my departure from Lebanon took place under relatively peaceful conditions and I was able to ship my gear as well as all logs and a few excess QSLs. I believe I have forwarded a card to every station with whom I had complete two-way contact. However, if anyone has failed to receive a confirmation I will be glad to forward a duplicate from my home address." Now Bob aims to get W8BKO back in action on the shorter end of the DX stick . . . . . The XW8AH address that follows is most applicable to the North American gang. W1EQ suggests that overseas DXers use: Sydney S. Wagoner, jr., c/o U. S. Embassy, Vientiane, Laos . . . . . "I invite all amateurs who QSOd VS1HQ and who have not so far received cards to write me at my G3LCS address (which follows)." Des states he has already QSLd all initial VS1HQ contacts but doubts that every card reached destination. "I would also appreciate *replies*," he adds . . . . . Serious note from W6BRF in Turkey: "We in a communication and electronic advisory capacity in Turkey are alarmed at the receipt of QSL cards over the past few years which is indicative of illegal operation. Rumors also have reached us of some persons possibly carrying portable equipment who may be operating despite prohibition. We are attempting to track down such rumor and stop such operation if it exists. 'Bootlegging' . . . can only jeopardise negotiations for permission to operate amateur radio in Turkey." We acknowledge these comments but must point out that TA calls can be signed by cranks anywhere in the world and QSLs for such nonsense naturally will wind up in Turkey. *Viz.*, the fact that such QSLs arrive in Turkey is no valid proof that clandestine Turkish amateurs exist. Furthermore, it is accepted by almost every government in the world that an organization of responsible amateurs with privileges to guard is the best possible precaution that can be taken against such illegalities. Self-policing is the term.

Africa — "If any of the gang have not received my VE3BQL/8U QSL, deserving parties can apply to my Ontario address [which follows]. Also petition anyone who still owes *me* a QSL to P8E! My successor in the Middle East is VE3EGD who will maintain phone schedules with Canada. Bob is not a DXer but could develop into one if the bug bites." . . . . . From ET2TO: "I'm engaged in the business of QSLing 100 per cent and *what* a job. I appreciate the time and savings in sending s.a.s.e. but I do wish more hams would use the self-seal envelopes or each place a piece of waxed paper between the gummed portion and the envelope proper. Thanks to high humidity in transit about 90 per cent of all ordinary envelopes arrive presealed. I found this same situation parvalent in the Canal Zone." . . . . . Nigeria QSL chief ZD2DCP tells W1VG he now holds about 300 undeliverable QSLs intended for former ZD2CKH. Which way did he go, which way did he go? . . . . . "At last I am in a position to say that all cards received by me have been answered," declares VQ2AS. "Any W/K station still due my card should let me know and I'll send out another."

Oceania — Remarks VK4NL to W6GMC: "For 250 contacts with W/Ks on October 12, 1957, in last year's VK/ZL Test, only 22 cards have been received. Not very impressive when I want to WAS." Have *you* answered all QSLs received at your station? . . . . . OVARA's *Ether Waves* (W8JIN, DX ed.) carries K6IGP/KP6's assurance of thorough QSLing upon his return to Encino . . . . . Now settling down at his new Key West U8CG assignment, former KC6CG operator Phil states he will QSL everyone still expectant . . . . . K4HRG is among those who report receipt of ZM1BL QSLs bearing an Apia, Western Samoa, legend and the name Al Thomas, "QSL care of XE2FA."

Europe — In contact with W4YOK, UA2KAW stresses the desirability of including operator serial numbers on QSLs to U.S.S.R. stations where this is possible, especially when club-collective "K" calls are involved . . . . . W8CSK mentions a DM QSL bureau at Box 37, Strausberg 1, D.D.R., but the Box 666, Halle/Salle, route still is valid . . . . . K2UYG ran into one LM8RF "somewhere near the Azores" which would seem to be a ship in the Norwegian block. We might caution here that FCC-licensed amateurs are authorized to work only other amateurs as indicated by internationally agreed-upon ham-type prefix-plus-numeral call signs. Exceptions often are authorised, such as Armed Forces Day contacts with AIR, NSS and WAR. And there seems to be no enforced prohibition of QSOs with such established unorthodox calls as RAEM, UPOL7, etc.

Hereabouts — Watch your Ks and Ws when using the *Call Book*, gang. It's very easy to slip down a notch and extract an address for the right suffix but wrong prefix. K4RQR describes a crucial example: 'Today, as has happened at other times in the past, I received a QSL card and self-addressed envelope for forwarding to a Caribbean station. My name and address were correct on this mail but my call appeared as *W4RQR*." These communications of course pertain to W4RQR's 1958 s.a.s.b. DX travels down in the islands. Offhand we can divine no compelling reason why said directory doesn't segregate W and K calls in distinctive blocks to eliminate this pitfall . . . . . "The KG1CK QSL backlog has been wiped out on a card-for-card arrangement. All cards went via the appropriate bureaus and I will continue to confirm KG1CK QSOs on a mutual exchange basis. I QSL direct on any Stateside request and via bureaus on foreign requests." Bud was harassed by dissemination of incorrect KG1CK addresses and expects to be signing W9UBT again by Christmas time . . . . . *Wow* — W2CTN now acts as world-wide QSL agency for FK8AT, JZ0HA, VK2s AYY/LH FR, VQ8CF, VR2s DA DK, XZ2TH and 9G1BQ. But don't omit those s.a.s.e., lads . . . . . K9LSN discovers that our September Stateside QTH for KG1EE doesn't pan out. Scratch one . . . . . "I've worked 130 countries and almost countless W/Ks during the past five months but have only twelve (12) QSLs to show for it." This unencouraging audit by VE8TO whose QSL pump certainly must be well primed by now. . . . . K6ZDL offers his services as Stateside QSL agent



UR2AR (left) and UA1FE are well-worked soviet DXers. The former frequently is encountered on 15-meter c.w. and phone running up to 200 watts. UA1FE is the son of UA1DG whose picture appears in your June 1958 column. Albert prefers 20 c.w. and a younger brother monitors DX proceedings as s.w.l. UA1-604. *(Photos via W9s WHM and UFV)*

for a deserving rare overseas op in real need . . . . . The boys at KG1CJ guarantee that "QSLs will be sent to all stations worked as soon as stock arrives from the printer. We hope it will be *soon* because contacts are really piling up. KG1s on 20 c.w. seem to strike the boys as reasonably rare." . . . . . Despite much furious spurious evidence to the contrary, WØAGO assures W1s AZW BDI VG and others that there was no legitimate 14-Mc. operation by HC8AGO . . . . . W1OHA reasonably holds that any amateur who has no intention of confirming QSOs with QSLs ought to have the gumption to say so during contact, a forthright IRC-shipment cavent . . . . . W1MEL finds it convenient to index recent "How's" QTHS in a little black book. Others prefer to use one *Call Book* each year for the purpose, annotating under the proper heading something like "VQ9GU, Oct., p. 66," conveniently abbreviated to "9GU 66 Oct". But bear in mind that many rare activations and QTHS are highly transitory. Take care to refer to the freshest data available in each case . . . . . Hint from WØLMB/7: "I send a photo of the rig, etc., along with each QSL card and my response is almost 100 per cent. A little personal touch really helps. What's one more W/K QSL to a DX station? One with photography attached at least rates a second look." W7DJU agrees . . . . . Donors of this month's QTH rundown include W1s BDI IKE KGH KRS, K1CCA, W2s HMJ JBL, K2IXP, W4s FFF Z8H, K4s IEX IGD OTG, W5KLB, W6s GEB KG ZZ, K6s CQF 8HJ ZDL, W7s DJU QNI, W8s C8K NOH YIN, K8ERU, W9s JJN LNQ, K9s ELT KEV, KØJPL, VE3EIL, VS1FJ, Patrick Wright, Newark News Radio Club, Northern California DX Club, Southern California DX Club, Ohio Valley Amateur Radio Association, West Gulf DX Club and Willamette Valley DX Club. And here we go. . . .

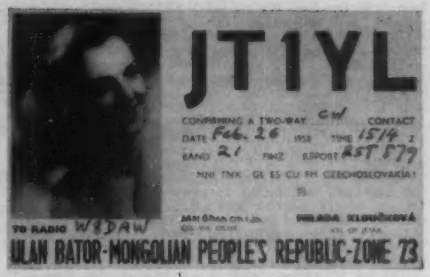
CE1AGI, 146 Bueras, Apt. 6, Santiago, Chile
CN2AK, T. Ramon, 2 Juana de Arco, Tangier, Tangier Zone
CN2BL, P. E. Oxild, 117 Blvd. de Paris, Tangier, Tangier Zone
CO2US, G. Mestre, P. O. Box 63, Marianao, Cuba
CP1AX, C. Greene (K2DGD), Instituto Linguistico, Casilla 64, Riberalta, Beni, Bolivia
FK8AT (via W2CTN)
FL8AC, G. Malosse, P. O. Box 121, Djibouti, Fr. Somaliland
FQ8AF, G. Crauet, P. O. Box 218, Brazzaville, Fr. Equatorial Africa
FU8AE, L. Chaumont, Port Vila, New Hebrides
HA5KFR, P. O. Box 185, Budapest 4, Hungary
HH2ID, L. Decatrel, P. O. Box 596, Port-au-Prince, Haiti
HI1BE (via HI8RM)
HK4AQ, G. Olarte, P. O. Box 2161, Medellin, Colombia
HL9KS, W. B. Carman (W1BJI), Hq. USA Advisory Gp., APO 102, San Francisco, Calif.
HR1LH (to W3WTE)
HV1CV (via ARI)
HZ1AB (see preceding text)
JZØHA (via W2CTN)
K6IGP/KP6 (to K6IGP)
K8OOF/VO1 (to K8OOF)
K8RDL/VO1, H. D. Benson, Box 88, APO 804, New York, N. Y.
KA2RS, T/Sgt. R. W. Stevens, 1954th AACS Sqdn., APO 994, San Francisco, Calif.
ex-KA9AA-KR6AA-W4VE-W5MY, Col. F. B. Westervelt, USMC, Croix Chapeau Medical Installation, APO 219, New York, N. Y.
KA9PW (to W7UYO)
KC6AO, U. S. Weather Bureau, Koror, Western Carolines
KG1AH, Lt. Col. John Wolfe, APO 23, New York, N. Y.
KG1CJ, L. E. Patience, 1953rd AACS Sqdn., APO 23, New York, N. Y.
ex-KG1CK (to WØUBT)
KL7CUR (to W7WPR)
KR6BF, American Consular Unit, Naha, Okinawa, or via APO 235, San Francisco, Calif.
KW6CU, Box 112, Wake Island
KZ5CM, Box 615, Curundu, Canal Zone
KZ5RR (to W3WTE)
KZ5US, R. Orbach (WA2ABH), Box 399, Albrook AFB, Canal Zone
MP4DAA, P. O. Box 330, Bahrein, Persian Gulf
MT4TG, Box 29, Mogadiscio, Somalia
OA4DE, M. R. Rusca S., P. O. Box 538, Lima, Peru
OA4GR (via OA4DE)
ex-OD5BZ (to W8BKO)
OE3RW/p (to OE1RW)
OE4FF/p (to OE1FF)
OQ9PB, Box 110, Astrida, Ruanda-Urundi, Belgian Congo
OR4OR (via UBA)
PY4OR, Rua Uba 475, Belo Horizonte, M.G., Brasil
SP1TN (to SP1KHA)
SP3SQ, Barbara Jarzombek, Box 412, Poznan, Poland
SP8CP, M. Bartnik, Box 336, Lublin, Poland
TG9RB (to W3WTE)
TI2USA (to W3WTE)
UP2KBC, Box 224, Kaunas, Lithuanian S.S.R.
ex-VE3BQL/SU, E. C. Veale, VE3BQL, 439 East 42nd St., Hamilton, Ontario, Canada
VK2AOO, A. O'Donnell (ex-ZC5AL), 207 Buccaneer Bay Rd., Caringbah, N.S.W., Australia
VP2LS, L. Ellis, P. O. Box 171, Castries, St. Lucia, W. I.
VP2MX (via KV4AA)
VP9EF, 1604th FMS, APO 856, New York, N. Y.
VQ1ERR (to VQ4ERR)
VQ1PBD (to VQ3PBD)
VS1BB/ZC5 (to VS1BB)
VS1GB, 16 Woodsville Flats, Woodsville Rd., Singapore 13
ex-VS1HQ, D. Shepherd, G3LCS, 35 The Crescent, Haversham Estate, Wolverton, Bucks., England
VU2AJ, B. Dutt, Overseas Communications, Service Janpath, New Delhi, India
W2EPS/KJ6 (to W2EPS)
W3VEX/KM6, L. Moorhead, Box 19, Navy 3080, FPO, San Francisco, Calif.
W3ZJU/KP6 (to W3ZJU)
W5EMB/VO1, J. Whitten, 1933-1 AACS Det., Harmon AFB, Stephenville, Nfld., Canada
W8ZVL/KL7 (to W8ZVL)
WØPBW/ZK1 (to WØPBW)
XE1JP, J. L. Alvarado, P. O. Box 60, Puebla, Puebla, Mexico
XE2MS, P. O. Box 182, Torreon, Coahuila, Mexico
XW8AH, Syd Wagoner (W8UTQ), Box L, Navy 150, FPO, San Francisco, Calif. (and see preceding text)
XZ2TH (via W2CTN)
YN1TF (to W3WTE)
YS1MM, M. Molina V., Box 517, San Salvador, El Salvador
YS1TT (to W3WTE)
ZA1s AA KB, Box 42, Tirana, Albania
ZB1DG, A. Farrugia, 16 Castle Hill, Victoria, Gozo, Malta
ZB1TC, A. Cefai, 102 St. George's St., Victoria, Gozo, Malta
ZB1USA, Navy 240, FPO, New York, N. Y.
ZC5GN (via G3JFC)
ZD2GWS, W. Slinger, c/o GPO, Yola, Nigeria
ZD2WCP, W. C. Pitman, c/o West Africa Airways, Ikeja Airport, Lagos, Nigeria
ex-ZD9AE, B. Brokensha, ZS6AJY, 2 Constellation Bldg., Rhodesfield, Kempton Park, Transvaal, So. Africa
3A2CF (to G3ZY)
4S7FM, RAF Ekala, c/o Katunayake, Ceylon
ex-4S7MA, R. Andree, Com. EL(R) Officer, R. Cy. N, Royal Navy Barracks, Devonport, Devonshire, England

9G1BO (via W2CTN)
9K2AT, Box 223, Kuwait, Persian Gulf

Whence:

Asia — Word from the Maldives front via W1WPO and ex-487DT: "VS9MI has been using an old army pack set with a vintage R107 receiver so the kilowatt boys shouldn't be too discouraged by 449 reports. Also we learn that G3FUB or another G will fire up in the Maldives. This place may soon be cluttered up with r.f.! The rig at VS9MA still is a DX-35 with AR-88 receiver, and the antennas include a long-wire and Lazy H. A beam, probably a quad, is contemplated but a tower must go up first. Our operating quarters may truly be described as a 'shack'. VS9MA's log now shows about 100 countries worked. Our condolences go out to the Yank Sixes and Sevens for there are only short evening periods when we can pull them through here. Finally, we hope to give s.s.b. a whirl thanks to W6UOU gear now going the rounds in this area." . . . . . Asian intercepts courtesy VS1FJ: Band conditions here have been quite good; 28 Mc. in the morning, 21 Mc. afternoons and evenings, and 14 Mc. open all day long to some place or other. . . . . No sign of the Ceylon ham taboo lifting, according to 4S7KD. . . . AC4AX is on 14,100 or 14,152 kc., mainly week ends, for short intervals between 1200 and 1400 GMT. He expects to remain in Tibet for a year or so. . . . There are about sixteen active VS1s. My 210/175 DX score is in for stiff competition from VS1s HU HX JF CZ and BB in particular." . . . . . W8UTQ puts XW8AH on 21 Mc. with potent signals from Vientiane. W1EQ found 8yd peaking nicely around 1700 GMT . . . . . From ex-VS1HQ: "I've been back at G3LCS since summer and am finally active once more with 45 watts on 20 and 15. A quad is in the works." . . . . . Hilda of KA2HA tells W7VCB she believes herself to be the only currently workable KA YL . . . . . K3CUI indicates that UA1GR/UA0 closed his 3.5- and 7-Mc. Tannu Tuva activation in October after many juicy QSOs from Saryg-Sep near Kyzyl . . . . . VS1GL confirms through W2HMJ the apparent impossibility of Andamans & Nicobars DXpeditionary licensing at this time . . . . . JA1BAL writes W7DJU: "A new class of license will exist in Japan next year. It will authorize JAs to operate c.w. on all bands except 20 and 15 meters and will be much easier to obtain than the present First Class ticket." . . . . . W6BRF and K9ACH write from Turkey where ham radio is just something to read about. The latter is stationed some 95 miles south of Istanbul and enjoys s.w.l.ing on 10 phone where exceptionally good signals from Ws 1HGZ 1MK 4BLG 4QAA 7MYG, K4ZAJ and other stations pour forth from his SP-600. W6BRF writes, "As of this date amateur radio, AFRS, and MARS operation is not allowed here although efforts continue for procuring a change in law to permit such operation. Ham operation took place initially in Turkey after WW-II apparently with the tacit approval of authorities. However, such operation was stopped in early 1953 due, it is claimed, to the interception of transmissions in which amateur operators were outspoken and critical of personalities, attitudes, politics, methods, and so forth." . . . . . W8YIN perceives W3DHJ performing as W3ZA/3W's second op on 20 side band . . . . . VS9AT's new DX-20 exhaler does well on 14,052-kc. c.w. according to W2HMJ . . . . . Oriental items courtesy WGDXC, OVARA, WVDXC and International Short Wave League organs: FCC-ITU Ban Listee 3W8FM claims Hanoi as QTH and gives the Czech bureau as a QSL route. . . . W3ZA/3W has been scheduling W2JXH daily between 1030 and 1130 GMT near 14,298 kc. . . . GM3LQZ now enjoys much DX sport as VS6EE while near-by club station VS6CT fattens its communal log with a homebrew 35-watter, AR-88, HRO, Vee beam, ground-plane and dipoles. . . . QSO output by Das Islander MP4DAA has our 14-Mc. school agog.

Africa — Our kaleidoscopic DX scene reflects the new autonomy of French Guinea where FF8AC has been holding forth on 20 c.w. . . . . VE3BQL/8U closed down his Rafah activity on the Gaza Strip and returned to Canada by way of Greece and Gibraltar where transcoffee QSOs with 8Vs and ZB2s ensued. "Ten opened to the U. S. A. a few weeks before QRT time so I had a real blitz giving out SU credits. Fifteen meters didn't open too often to W/K-land but we knocked off plenty of Asians, Pacifics and Far Easterners on that band. Nothing especially startling so far as 20 was concerned, just the usual traffic skeds with VEs." Elvin fought hard for WA8 but Idaho, Nevada, N. Mex., Utah, Vt. and Wyo. held out. "Home in Hamilton I hope to be active on all bands as before, 75- and 80-meter net activities included." . . . . . ET2TO left Eritrea last month but expects to return to Asmara in March or April. Tom will be busy in Morocco during January and February . . . . . ZS6ALH tells K6DDO of his hunger for Idaho, Me., Mont., Nev., the Dakotas, Utah and Vt. around 21,330 and 28,490 kc. . . . . FQ8AF frequents ham bands once again from Brassaville after six months on the Continent. W1KR8 finds him interested in receiving unneeded electronics literature, technical reviews and the like . . . . . W2JBL collided with W1YLY behind the 14-Mc. key of CN8GD . . . . . W8YIN hears that


JT1YL
CONFIRMING A TWO-WAY C.W. CONTACT
DATE Feb. 26 1958 TIME 1514 Z
BAND 21 MHZ REPORT RST 579
TO RADIO W8DAW
ULAN BATOR-MONGOLIAN PEOPLE'S REPUBLIC-ZONE 23

The world's rarest YL dispenses a fetching QSL.

ZS6AQQ may try a little more ZS9ing this month. Meanwhile he has interested ZS9s A and P in the possibilities of single side band. Mickey also notes that the XYL of 15-meter specialist ZS5DW now signs ZS5KQ . . . . . K8ERU learns that ET2KY resolutely maintains a black list of DX piggies whose uncouth tactics disqualify them from entry in his log . . . . . Club African data via 8CDXC, I8WL and WGDXC: VQ1s ERR (September) and PBD (October) were effectively actuated by VQs 4ERR and 3PBD. . . . G3JKO now is said to be in the Sudan with operational inclinations. . . . FB8BC expresses his opinion that FB8CD may well be back in the Comoros this month.

Oceania — VS1FJ's voluminous DX notebook deserves another peek: Frank finds that VS1BB/ZC5 had a fall ball in North Borneo with W6UOU's s.s.b.-generating sputnik. . . . VS5AT is intermittently radio-active on 14-Mc. voice when other activities permit. . . . ZC3AC keeps oozing Christmas spirit on 14,052, 14,082 or 14,109 kc. daily around noon GMT . . . . . K6IGP/KP6's month on Palmyra passed fast thanks to 300 watts and a phased array on 20 phone. OVARA tags him as an Air Force man . . . . . VK2AOO (ex-ZC5AL) tells W6KG that future United Nations assignments may take him to additional rarish locales . . . . . W6ZZ observes ZL2GX maintaining order in 20-meter Kermadecs queues seeking consultations with ZL1ABZ. Mike hangs out around 14,315 kc. and his aversion to c.w. calls many a dusty rusty modulator into play . . . . . K8ERU was particularly delighted to work VR2DK. "Imagine being anybody's first Ohio QSO!" . . . . . Seekers after WAIL (worked all island locations) credentials may be interested in lines from W3VEX/KM6. "The Midways consist of two main islands, Sand and sparsely populated Eastern. The latter finds use as a remote-receiver communications post and heretofore has based no ham station." Larry hints that somebody soon will take care of that, however . . . . . KH6MG and W9PBW completed solar eclipse observations and an astronomical quantity of 10- and 15-meter contacts from the Danger

VS1FJ's homespun 25-watter claims a QRO-type DX record: 210/175. The receiver is an Eddystone 888; antennas include a ground-plane for 14 Mc. and an 86-foot wire center fed with open line for 40, 15 and 10 meters. You may recall Frank's equally potent QRP DX work under previous VS9GT and MP4BAB colors. A photo of VS1FJ's Somerset home station, G3IDC, appears in March 1954 QST DX pages.

Islands in October. We second W8YIN's motion for more eclipses and eclipse expeditions. . . . . WVDXC and WGDXC dispatches from the Pacific: ZL3DA's first thousand Chatham QSOs included some 900 with W/K aficianados. . . . VR3A sustained a fractured leg in a Fanning accident and recuperates in Sydney. . . . VK2AIR of VK2AYY/LH fame still strives mightily for VR5 and/or ZM7 DXpeditionary authorization.

Europe — W2SHC relates interesting PX DXcursional plans of CN8IU: "If all goes according to plan Pitt will be operating 10, 15 and 20 meters, a.m. and probably s.s.b., from the 14th to 20th of this month. He is also applying for a 3A2 call." CN8IU is in process of transferring to Germany and will motor northward through Spain and France, wintry weather and all. . . . . W2HMJ has it that LAs 4DD and 6CF revise estimates of earliest Jan Mayen activity forward to 1960. . . . . Well-known W5MY, erstwhile ex-W4VE-KA9AA-KR6AA, now serves with the Marine Corps near La Rochelle, France, and awaits his F7 suffix. "This is my first tour in Europe," writes Fred, "and probably the last tour for me anywhere before retirement. I have my Navigator and 75A-3 all set up and I'm impatient to get on the air from this excellent location. Signals roll in from all over the world and there is very little man-made noise. I certainly look forward to firing up and renewing acquaintances with the gang on 7-, 14- and 21-Mc. c.w.!" . . . . . Increasing visual difficulties hamper I1ER in carrying out his ionospheric propagation studies and experiments in Milan. Not many IIs can match Mario's towering total of W/K/VE contacts and sterling QSL performance. . . . . DL1GR, G3GIY, IIs DFC FA MF O8 TCI, OE8KI, YU2s HK IP LJ and ex-W7AIU were among the DX contingent attending Padova's recent ARI convention. I1DFC will be recalled as former HL1AA. . . . . Continental notes from WGDXC and I8WL: G3FPT indulged in autumnal 3A2BT work on 20, 15 and 10 meters with a versatile KWM-1. . . . In five years as a merchant mariner G3JPQ has visited 48 countries, thus surpassing his home station's countries-worked tally.

South America — CE3AG, assiduously cooking up Juan Fernandez furor tentatively scheduled for next month, redefines the Chilean prefix pattern as follows: CE1-CE8, contnental Chile; CE9AA-CE9AM, Grahamland, Antarctica; CE9AN-CE9AS, Deception Island, South Shetlands; CE9AT-CE9AZ, Greenwich Island, South Shetlands; CEØA, Easter Island; and CEØZ, Juan Fernandez. The latter consists of three islands of some 70 square miles total area, these discovered by a Portuguese pilot serving Spain 'way back in 1574. This gentleman, one Joao Fernandes, had true DX spirit and was granted the islands by the Spanish crown. He stocked the place well with pigs and goats but must have run out of QSLs and 807s, for he soon abandoned residence. Not much more was heard from Juan Fernandez until a century later when a haphazard and eventful DXpedition by an Alexander Selkirk set the stage for Defoe's *Robinson Crusoe*. Anyway, the important consideration to bear in mind here is that the CE prefix now covers five countries on your ARRL DXCC Countries List. . . . . LU7CW tells K8ERU that one of the most outstanding memories of his recent trip to the States is that of his visit to ARRL Hq. . . . . PJ2ME tells W7DJU that his venerable regenerative receiver finally gave up the ghost after fighting its way through many a 14-Mc. Sint Maarten pile-up. Neighbor PJ2AV is back on the beam after a Netherlands summer holiday. . . . . OA4DE's XYL, OA4GR, keeps Marcelo's Lima 250-watter warm during office hours but the OM takes over at night. Ten and 15 meters are favored. . . . . From K2DGD down south: "I'll be seeing the gang from CP1AX until January of '62. I'm in Bolivia as radio technician with the Jungle Aviation and Radio Service branch of the Wycliffe Bible Translators. We provide transportation in and out of isolated tribal regions and radio contact while traveling." . . . . . W1RST figures that CE3DZ and he have swapped 18,500 words of traffic with KC4USK of Wilkes Station, Antarctica. 8tu served as key relay link between Wilkes scientific leader Eklund and the latter's family in Santiago because the CE3DZ-KC4USK propagation path was found to be a steady washout. . . . . W9LNQ mentions a late Trindade effort by PYs 1HQ and 7AN signing PYØNA on s.s.b. and PYØNE on c.w. WGDXC diggers discern that Fernando's PY7AFN seeks North Dakota on 14 Mc. to conclude his WAS pursuit. One PYØFDO also claims to represent the place on 20 code. . . . . CE3AG gives CEØAC's Easter Island 14-Mc. c.w. program as 0200–0300 GMT, Wednesdays and Sundays. A BC-610E makes that noise. . . . . HC8s LUX and WGF (W6s LUX and WGF) put Operation Turtle and the Galapagos on 15- and 20-meter phone beginning October 9th from Cristobal Island. WØAGO, however, found it necessary to return to Minnesota from Quito before he had an opportunity to put HC8AGO on the air. W6ZZ and friends QSOd HC8WGF/mm aboard schooner *Don Tito* as the sails neared destination. . . . . Grahamlander VP8DN hopes to manage WAS with a c.c. 14-watter lurking on 14,030 kc. almost daily between 2300 and 0245 GMT.

Hereabouts — W2HMJ understands that HRØAA is a gent bent on finding a quiet spot to settle down; hence his 14-island Honduras tour. How about the Aldabras, man? . . . . . VE8TO runs 500 watts to a 375-ft.-per-leg Vee beam up north, receiving with a cool 51J-4. "This layout is a far cry from the 35-watter I nursed along at GM3HLD!" . . . . . "KG1CJ is operated by W4HGQ, K2HUE and myself, KØKT8, I prefer c.w. around 14,050–14,060 kc. but Luke and John vote for s.s.b. near 14,275. Our gear includes an HT-32, SX-101 and 3-element 20-meter rotary. A 500-watt linear amplifier project is under way." . . . . . S.w.l. Patrick Wright observes interesting activity by VEØMC aboard *CGS Stonetown* in the Pacific. A DX-40 sender and home-styled receiver suffice. . . . . W8KX's DX buddy ex-W8ESR now signs WA6AMZ out West — and it isn't easy. . . . . San Diego DX Club hosted DX Breakfast doings at the ARRL Southwestern Division Convention in October. W6AM and cohorts enjoyed a meeting with Hq.'s W1LVQ, FO8AT Clipperton color slides courtesy W6ZVQ and friends, and W6LRU's tricky DX questionnaire. KR6LJ and W6AM tied for top honors in the brain strain. . . . . "CO2DD now is a student at M.I.T.," informs W1NTK. "He expects to be a New Englander for the next five years." . . . . . W3WTE, accompanying Dr. Milton Eisenhower's Central America fact-finding tour, ran off 314 multiprefixed DX QSOs with a KWM-1 in late July. Bob signed HR1LH, KZ5RR, TG9RB, TI2U8A, YN1TF and YS1TT along the route. . . . . KZ5U8 (WA2ABH) enthuses, "Ten really has been hot here this fall! It seems that most of the KZ5 boys don't care too much for 'this DX stuff' so I'm creating quite a series of pile-ups." . . . . . K6CQF plumps for greater respect for the KN sign. In the final analysis it's all up to the DX stations who use it. If violations are permitted to pay off, more violations there will be. . . . . W8YIN has VP2VB's pending *Yasme II* itinerary as Dominica, Guadeloupe, St. Vincent, Anguilla and Grenada; Daniel's Pacific Ocean e.t.a. is April. . . . . WGDXC DX detectives detect rumblings of impending Cocos Island (TI9) developments.

When DX men think of the Azores they usually think in terms of CT2BO. This isn't surprising because Gil has logged over 13,000 QSOs on DX bands since 1936. He runs about 40 watts and does fine with that S-40A receiver. ***(Photo via W7PHO)***

Ten Years Ago in "How's DX?" — Superfluous testing gets a lambasting in the December 1948 column's preliminary commentary. . . . . W6CIS reports working Z82G for a neat 3.5-Mc. West Coast WAC. Forty is slow, though. . . . . Twenty c.w. offers AP4A, C7LT, one CZ2AC purportedly in Monaco, EPs 1J 2B, curious HDPP of the Galapagos, HL1s AB BA AE, Js 6LPP 7ABN 9AC8 9ANZ, KAs 1U8A 6FA, M1B, MD2BU, MI3AB, PJØX, TT1KY, VU4AC, Ws 3MPM/C7 4DGW/KJ6 6ZNT/KW6 8MCF/C1, YR5I, YU7AX, ZC6XY, ZD9AA and ZP3AW. . . . . Phonewise on 14 Mc. Cs 1CH 3EA 7AC, HB1ED, HL1s AA BG BK, J7ACS, KA1AF, VR3A, W6RET/KG6 and ZC6UN are on hand. . . . . AP2F, J2AZA, MB9AD, MD3AB, Ws 6YOT/C6 and 7ILE/KX6 top the ten-phone crop. On 28-Mc. c.w. W2WMV/C9 continues to draw heavy code fire. . . . . Scattered chatter: W2AIS departs for Palestine with great 3.5-Mc. determination. . . . J2AHI apparently spearheads Yanks-in-Japan DXers with 140 worked. . . . AR1WW returns to W2VLG and a mountain of QSLs. . . . VP2GJ of Windwards DXpeditionary sensation turns out to be none other than ex-ARRL staff man VE3QV. . . . . Pix of GI6TK, VU2FS and HC2KJ appear — and there is evidence that our fearless factotum, J. J. Jeeves, is beginning to enjoy ramifications of TVI.

The World Above 50 Mc.

CONDUCTED BY EDWARD P. TILTON,* W1HDQ

Most of our leading 2-meter operators around the country have worked distances in excess of 1000 miles at one time or another. Some of these long-haul contacts were made by capitalizing on meteor showers or auroral conditions, but a vast majority of all the 144-Mc. DX on record is tropospheric in nature. This predominance of weather-induced DX is even more marked if we include all the work done over greater than normal distances.

Yet how many 2-meter men have worked all the states within a 1000-mile radius? Relatively few have turned the trick, and most of these have done it only recently. Why the lag? The answer is found in the geographical distribution of activity.

V.h.f. interest developed first in areas of high population density. It took many years to convince amateurs in other sections that operation on a v.h.f. band is worth the effort, but now we have well-equipped stations and alert operators in almost every corner of the country. As a result, 2-meter men less often find their range under favorable conditions limited by an "activity barrier."

For years we have dreamed of working the length of the Atlantic Seaboard on 144 Mc. Someday a Maine-to-Florida contact will be made on 2 meters, and the only real stumbling block in the way is the lack of well-equipped stations all along the line, with their owners knowing when to try. The same can almost certainly be said for a Seattle-to-San Diego QSO. Neither of these events has yet come off, but the Atlantic Seaboard was all but spanned during the tropospheric propagation of early October.

This was no ordinary coastal inversion. The opening first manifested itself far inland during the evening of Oct. 7. Hurricane Janice was churning her way up from the Caribbean, the far western fringes of her skirts hurling Gulf of Mexico weather up over New England, bringing that delightful condition known variously as "Indian Summer" and "World Series Weather." Tropospheric propagation was good on all the v.h.f. bands, around the clock, for days and nights on end. It is often that way during the hurricane season.

Around 2030 EST on Oct. 7, W4EQM, Langdale, Ala., began to hear weak phone signals from the northeast. At 2050, Carey identified W1JDF, Methuen, Mass., raised him on a c.w. call, and the most extensive tropospheric opening on record for the eastern seaboard was under way. W4EQM was busy until 0130 the following morning, working W1AZK, Chichester, N. H., W2BLV, Haddonfield, N. J., W2ESX, Moorestown, N. J., W1JSM, Waltham, Mass., W2AZL,

1 WØZJB	14 WØHVW	26 WØMVG	39 WØDDX
2 WØBJV	15 WØWKB	27 WØCNM	40 WØDO
3 WØCJS	16 WØSMJ	28 W1VNH	41 K9DXT
4 W5AJG	17 WØOGW	29 WØOLY	42 W6ABN
5 W9ZHL	18 W7ERA	30 W7HEA	43 W6BAZ
6 W9OCA	19 W3OJU	31 KØGQG	44 VE3AET
7 W6OB	20 W6TMI	32 W7FFE	45 W9JFP
8 WØINI	21 K6EDX	33 WØPFP	46 WØQIN
9 W1HDQ	22 W5SFW	34 W6BJI	47 WØWWN
10 W5MJD	23 WØORE	35 W2MEU	48 K9ETD
11 W2IDZ	24 WØALU	36 W1CLS	49 WØFKY
12 W7LLL	25 W8CMS	37 W6PUZ	50 W8LPD
13 WØDZM		38 W7ILL	51 WØZTW

W1FOS	47	W4EQR	46	W7YJE	46	WØIBL	46
W1AEP	47	W4LNG	45	W7ACD	46	WØJOL	46
W1CGY	46	W4RFR	45	W7JPA	46	WØJHS	46
W1LSN	46	W4AKX	44	W7CAM	45	WØOFZ	46
W1SUZ	46	W4MS	44	W7BOC	45	WØYZV	46
W1RFU	45	K4DNG	44	W7MAH	42	WØQVZ	45
W1ELP	44	W4HHK	43	W7MKW	40	KØAKJ	45
W1KHL	44	K4GYZ	43	W7JRG	40	WØWNU	45
W1IKO	44	W4FNR	42	W7UFB	39	KØDXS	44
W1CLH	44	W4ZBQ	42			KØGKR	43
W1LGE	43	K4AGM	40	W8SSD	47	WØBTG	43
W1FZ	43	K4KYL	40	W8HXT	47	WØPKD	43
W1TAM	42			W8WPD	47	KØCLJ	41
		W5VY	48	W8HJR	47		
W2RGV	47	W5LFQ	47	W8RFW	47	VE7CN	45
W2BYM	47	W5ONS	46	W8NOH	47	VE1EF	42
K2ITP	47	W5VV	45	W8SQU	46	VE7AQQ	40
W2FHJ	46	W5EXZ	45	W8OJN	46	VE3AIB	39
K2CBA	46	W5FSC	45	K8CIC	46	VE2AOM	38
K2ITQ	46	W5BXA	45	K8ACC	46	KL7AUV	36
W2SHV	45	W5KTD	44	W8NQD	45	EI2W	35
K2AXQ	43	W5FXN	44	W8UZ	45	VE3BHQ	33
W2EIF	43	W5ML	44	W8ESZ	44	VE3DER	33
K2VIX	42	K5ABW	42	W8INQ	43	VE1PQ	32
K2LTW	42	W5HEZ	42	W8EVH	42	VE3OJ	32
W2ORA	40	W5JME	42			VE4HS	31
		W5CVW	42	W9BRN	48	XE1GE	30
W3TIF	47	W5VVW	42	W9ZHB	48	SM7ZN	29
W3KKN	45			W9QUV	48	PZ1AE	28
W3KMV	45	W6UXN	48	W9RQM	47	VE1WL	28
W3RUE	44	W6WNN	48	W9MHP	47	CO2ZX	27
W3MXW	44	W6IWS	48	W9AAG	46	ZE2JV	26
W3BGI	44	W6ANN	47	W9DSP	46	LU9MA	26
W3OTC	42	W6GCG	47	W9EPT	46	ZS3G	26
W3FPH	42	K6JCA	47	W9JCI	45	SM6ANR	24
W3NKM	42	K6HYY	47	W9UIA	45	SM6BTT	23
W3ZYK	42	W6NLZ	46	K9EID	45	VE1ZR	23
W3LFC	41	W6JKN	46	W9SWH	44	CO6WW	21
		K6KXR	46	K9GFQ	43	LA9T	20
K4DJO	47	K6RNQ	45	W9KLR	43	LA7Y	18
W4UMF	47	W6AJF	45	W9IMG	42	VQ2PL	18
W4AZC	47	W6CAN	44			KH6UK	17
W4UCH	47	W6NIT	43	WØAEH	47	JA1AUH	16
W4EQM	47	W6BWG	40	WØFKY	47	JA8BU	14
W4IKK	46	K6ERG	40	WØNFM	47	ZE2JV	12
W4ZE	46	K6UJL	40	KØDTA	47	JA1AAT	12
W4CPZ	46			KØJJA	47		
W4FBH	46	W7DYD	47	WØDGE	47		
W4FLW	46	W7INX	47	WØEDM	47		

* V.H.F. Editor, *QST*.

Raritan Bay Radio Amateurs, Inc.
SOUTH AMBOY, N. J., U.S.A.
This is to certify that K1CE
has been awarded membership in
THE
1000 MILE CLUB
by having established Amateur Radio contact over a distance of 1000 miles
or more on a frequency of 144 MC.

Certificates are a dime a dozen these days, but here is one that has real significance. Offered by the Raritan Bay Radio Amateurs of South Amboy, N. J., it sets up a 1000-mile club for 144-Mc. men who have done two-way work over distances in excess of 1000 miles. Proof of such contact should be submitted to W2TTM, Secretary.

Plainfield, N. J., K1CRQ, Bethlehem, Conn., W3TDF, Langhorne, Pa., W2BV, Minotola, N. J., W2AMJ, Bergenfield, N. J., W1AJR, Middletown, R. I., W4FJ, Richmond, Va., K2QJY, Farmingdale, N. J., K2IEJ, Oceanside, N. Y., W1RJA, Milford, Conn., K4EUS, Chester, Va., W1RFU, Wilbraham, Mass., W1REZ, Fairfield, Conn., and W1KCS, Providence, R. I. Most of these meant a new state for the stations involved, and all were tropospheric firsts.

Several of the fellows listed above reported hearing QRM on W4EQM, eventually finding this to be caused by W4FWH, Doraville, Ga. He and W4LNG, Atlanta, got in plenty of contacts, though we do not have complete lists for them at this writing. W4LNG was alerted by telephone by W2BLV. Ruddy had his final stage dismantled, but got on with his 5894 exciter and did right well.

The following evening the center of action swung slightly to the east, and the long-awaited opening to Florida developed. W4RMU, Oceanway, Fla., near Jacksonville, was the hero of this occasion. Allen had been keeping nightly schedules beaming north at 2100 for some time, and this paid off on the 8th. Having access to weather information, he was not too greatly surprised when W4LTU, Falls Church, Va., called him on c.w. after his 10-minute schedule transmission. While this QSO was going on, W4RMU's telephone rang, and W2BLV reported that he was S3 in Haddonfield, N. J.

W4LTU swung his beam around to the northeast to spread the word and another DX session was rolling. Allen was going strong until 0200 EST on the 9th, working, in this order, W2CXY, Chatham, N. J., W2PAU, Westmont, N. J., W4DBV, Rome, Ga., W3PYW, Silver Spring, Md., W2BV, W3TUZ, Wheaton, Md., W2AZL, W2AMJ, W1REZ, K4TNB, Arlington, Va., K2QJY, K2GQI, Keyport, N. J., W4UMF, Falls Church, Va., W3TDF, and W3UJG, Rockville, Md.

W4RMU sent us upper air soundings taken over Charleston, S. C., at 1900 EST on the 8th and 0700 on the 9th. Janice was centered out in the Atlantic, east of Myrtle Beach, S. C., during this period, and an elongated high-pressure area extended down the Atlantic Seaboard. The 0700 temperature curve for Charleston shows an 18-degree inversion at 4000 feet, with temperatures higher than the surface reading all the way up to 15,000 feet. Dewpoint readings show very marked layers of dry air between 3000 and 6000 feet and 14,000 to 15,000 feet.

Allen reports that conditions did not seem to be entirely reciprocal. At no time did he hear more than 3 or 4 stations, and the band was dead for periods of ten minutes or more, yet stations all the way from Georgia to New England were hearing and calling him. W4TKE, Gainesville, Fla., came on at 2345 EST, but managed to work only W2AMJ. W4MBR was on in Vero Beach and heard W4RMU working W1REZ, but neither he nor W4TKE heard any W1s. The W1s, on the other hand, heard W4RMU as far north as W1AZK, Chichester, N. H., who reported Allen S3 at 2237 EST.

To answer the many "Where were you?" queries we received, W1HDQ was on 220 Mc. both nights. There we still have an activity barrier. Signals from the southwest were simply tremendous — what there were of them. W3UJG, Rockville, Md., was S9-plus for hours on the night of the 7th, and we managed a QSO with W4UBY, Annandale, Va., who was running only a 6360 and an indoor beam. He was the end of the line. Who knows what might have been done, had some 220-Mc. stations been active in the Carolinas or farther south, with a reasonable

RECORDS

Two-Way Work

50 Mc.: LU3EX — JA6FR
12,000 Miles — March 24, 1956

144 Mc.: W6NLZ — KH6UK
2540 Miles — July 8, 1957

220 Mc.: W9EQC — W2DWJ
740 Miles — September 17, 1957

420 Mc.: G3HAZ — DL3YBA
500 Miles — June 19, 1957

1215 Mc.: W6MMU/6 — K6AXN/6
270 Miles — Sept. 21, 1958

2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

***3300 Mc.: W6IFE/6 — W6VIX/6**
190 Miles — June 9, 1956

5650 Mc.: W6VIX/6 — K6MBL
34 Miles — October 12, 1957

10,000 Mc.: W6VIX/6 — W6BGK/6
124 Miles — June 23, 1957

****21,000 Mc.: W1NVL/2 — W9SAD/2**
800 Feet — May 18, 1946

***Band now 3500–3700 Mc.**
****Band now 22,000 to 23,000 Mc.**

amount of power and big antennas? The events on 144 Mc. these evenings give some clue.

50-Mc. DX News

If there ever was any doubt that Cycle 19 (sunspot number records date back to 1750) is the hottest ever, it should be dispelled by our 50-Mc. experience this fall. In the previous cycle there was only one year (1947) in which an appreciable number of 50-Mc. contacts could be made across the Atlantic. We have already had two record fall seasons, 1957–8 having offered 50-Mc. DX almost daily from late October to February. How will it go this year?

The transatlantic F_2 DX season began Oct. 14, at least a week ahead of schedule, with reception of European TV signals up to about 50.6 Mc. in midmorning. The first cross-band contacts with British 10-meter stations were made two days later, and the band was open between the East and West Coasts the same day. The first transcontinental contact we have record of was made by K6SRC, San Bruno, Cal., and W4CQP, Hollywood, Fla., at 0731 PST, Oct. 16.

The automatic c.w. of CT1CO, Lisbon, Portugal, was first heard by the writer and W1SUZ on Oct. 18. Manuel came through progressively earlier the next two days, his signal appearing out of the background noise at 0700 EST on the 20th. It should be a relief to 6-meter men on the West Coast to know that CT1CO may now be found on 50.008 Mc., instead of his former 50.1, probably the worst possible spot for weak-signal DX work. Thus far we have heard him only on automatic. Though the keying sequence has been changed he still sends "CQ de CT1CO." Long dashes are interspersed, to show that this is in the nature of a test transmission.

EI2W, near Dublin, Ireland, worked his first 50-Mc. DX of the fall season Oct. 19. Harry was on voice, using the same frequency as last year, 50.016 Mc., though he may move up higher in the first 100 kc. soon.

KL7AUV, Anchorage, Alaska, heard his first signs of 50-Mc. DX Oct. 15. At noon on the 17th JAs started coming through, weakly and with deep fading. Jack and wife Margie, KL7BLL, worked three of them, the opening lasting about an hour. Signals were better on the 18th, and 13 contacts were made with 10 different JAs, between noon and 1408 Anchorage time. The Alaska 6-meter fraternity has lost KL7AZI, KL7MS and KL7CDG, all of whom are now in the States, but Jack hopes that more recruits will come in to fill the gap left by these stalwarts. Anchorage stations are working above 50.1 Mc. this year, to keep down local QRM at the low edge.

A path never before covered on 50 Mc. was worked on Oct. 8, when CT3AE, Madeira Islands, worked JA3CE and KA2AS around 2400 GMT. Signals were of moderate strength, with much fading. José reports that his beam peaked southwest for best signal strength. Was this long-way-around transequatorial scatter? CT3AE found the band open to Japan again on the 11th, working JA3CE and JA2AEQ. Transequatorial scatter to Argentina and Brasil was very good, the band being open for this mode 7 out of the first 12 days of October.

One ham who hit the *TE* season right on the nose, without knowing what he was getting into, is KZ5CN, Howard Air Force Base, Canal Zone. At the urging of friends in Caracas, Skip got on 6 Sept. 30. He finished hooking up his 6-meter converter at 2030 on that date, and two minutes later he heard LU1ABF calling CQ 6. Contact was made, and at once KZ5CN found himself swamped with calls from Argentina. Up to Oct. 10, KZ5CN had heard only LU and CE, but he and KZ5LP will be watching the band in other directions.

An interesting prospect for 50-Mc. DX is VU2CQ, Bombay, India. Mickey was on 6 during the previous solar cycle, and is an old hand at all kinds of DX work. W1YPK and others tell us that he is on 28.25 Mc. looking for v.h.f. men in the States who can work on 10.

Transequatorial work, some of it apparently not of the *TE* scatter variety, is reported by W5LFM, San Antonio, Texas. Cal worked LU3EX, LU4DFN, XE1PFE and XE1NI, Sept. 20, the latter two presumably by sporadic *E*. CE8AE, CV3, OA3AAF and many LUs were heard, in an evening session lasting from 1850 to 2235 CST. On Sept. 28 the IGY stations were heard at 0840 CST, by normal F_2-layer propagation. They stayed in all morning, with varying strengths, reaching the strongest on record around noon. CE8AE remained audible until about 1615, but in all that time no 50-Mc. amateur signals were heard.

We strongly suspect that most South American 50-Mc. operators are so surfeited with *TE*-type work in the evening hours that they do not monitor the band extensively in daylight. Early in the morning of Oct. 16 we heard many Spanish-speaking f.m. telephone signals near the low edge of the band, and the IGY stations were in for a short time around 0900 EST. Back-scatter signals from W2 and 3 could be heard at W1HDQ at this time, but not a sign of a South American amateur signal could be found.

Something new in 50-Mc. DX broke at midday Oct. 23, with the appearance of XE1GE in northeastern U.S.A. Not that Jeff is any newcomer on 6 anywhere in the country, but to have him boom in with an S9-plus F_2-type signal *is* new. We've worked XE1GE by every weak-signal mode known to man, and for many years, but by all reports there was nothing weak about the signal he poured into W1 and 2 during the Oct. 23 noon hour. It's less than 2200 miles from Southern New England to Mexico City, so this is on the near edge for normal F_2. Your conductor missed this one, so we will have to wait to check the reports in greater detail, before classifying it as to propagation mode, but it was different from anything heard from XE1GE in these parts heretofore.

We write this material with the feeling that all that has happened thus far (up to the last week of October) is but a prelude to one of the most interesting seasons 6-meter men have ever experienced, and that what we report here will

Don Goshay, W6MMU, tests out his 1296-Mc. station in preparation for an onslaught on the DX record. W6MMU/6 has broken the record twice, the most recent expedition being described herewith. Equipment is crystal-controlled for both transmitting and receiving, and c.w. only is used on 1296 Mc. Communicator is employed in liaison work. Details of the W6MMU 1296-Mc. converter will appear shortly in QST.

read like ancient history by the time it appears in print. One thing seems certain, however: even if we are over the peak of this solar cycle, its declining phase should spring plenty of surprises.

Best guesses now are that paths in the northern hemisphere will show m.u.f. about the same as last year, but that there will be more disturbances. Aurora should be more frequent, and more violent. North-south openings, usually associated with disturbed periods, should be more frequent than during the rising phase of this cycle. African countries may come through, even if the m.u.f. on east-west paths above the equator falls below last year. Watch the frequencies just below the band for commercial signals, and be sure you check in all directions. Don't give up on 6 just because the Europen TV signals stop coming through!

Here and There on the V.H.F. Bands

The annual Midwinter V.H.F. Conference will be held Dec. 6 at Western Michigan University, Kalamazoo, according to word from W8NOH. Chairman will be W8CVQ. Reservations may be made through him or W8JUU.

A preamplifier for 50 Mc. can be had the easy way by using a TV booster tuned to Channel 2. Jim Robinson, call not known, uses a Mallory MTB-13X to hop up reception on his S-106.

Some of the contact totals now being run up on 6 are all but unbelievable to those of us who lived though the sparse activity of the early '50s. As an example, K5OQN, Houston, Texas, has 457 QSLs for contacts made between March 15 and Oct. 1 of this year. Most of these were made with a Communicator, while his 250-watt rig sits idly by.

The SCM for South Texas, who passed along the above info, also tells us that W5TKP is working out with a transistor rig on 6, putting some 16 milliwatts into the antenna.

Having gotten up to 42 states on 6, W7MAH, Reno, Nev., is putting a big signal on 144 Mc. as well. John has a 4X250B, a long Yagi and a 417A converter ready for DX schedules. He will continue on 6 during the F_2 season, too, in hope of catching Delaware, South Carolina, Kentucky, Wisconsin, West Virginia and North Dakota. Nevada going begging on 6? Times *have* changed!

From Down Under, VK3ZDG passes along the details of the Australian limited license. It involves a technical examination of somewhat stiffer nature than our General Class. Privileges are the same as for the regular ticket, except that operation is confined to the frequencies above 50 Mc., and *the holder may not use c.w.* Maybe that would be a good idea here — make it a privilege to use the code! Holders are identified by three-letter Z calls. Aussies may soon lose 50 Mc. to television, though they are trying hard to retain it for the present, at least.

Tropospheric scatter schedules are still being maintained by WØIC and W5VWU, as reported last month. Signals are heard regularly both ways over this mountainous path, but generally the copy is poor. Not enough experience has been accumulated over circuits of this kind to know what to expect, and opinions differ considerably. On a path where tropospheric bending is likely to occur there almost certainly would be stronger signals in the warm months. Over rough and irregular mountain terrain there is likely to be almost constant turbulence, with conditions favorable to scattering, but not to bending, with the result that conditions should vary little around the year.

Here's some unusual mobile DX on 144 Mc. WØZJB, returning from the National Convention, caught a tropospheric opening while driving across Ohio and Indiana. W4HJQ, Glendale, Ky., was raised when WØZJB/8 was 20 miles east of Columbus, Ohio, a distance of about 240 miles. Contact was maintained to Richmond, Ind., W8SQU, Cleveland, was picked up about 50 miles west of Columbus, and held into Indianapolis, about 250 miles. All this was without the usual mobile flutter. The W3MSR/9 mobile work with W9TQ and WØYPT, reported last month, was on 144 Mc., not 50 as stated in November *QST*.

This sunspot cycle being what it is, we should not place too much dependence on past experience in looking for DX on the v.h.f. bands. Auroras, for example, may be showing up at all hours, rather than just the late afternoon or early evening. Take the period beginning Oct. 22, for example. There was a fairly good aurora the night of the 22nd, early in the evening, but fellows who hung on for a late-evening recurrence waited in vain. There was a milder aurora early the next night. There was just a slight trace of fuzz on some 6-meter signals when your conductor checked at 2230 EST, and it disappeared soon after, so we quit. A look at 0630 on the 24th showed some faint buzz on near-local signals, but no DX. At 0715 things picked up, instead of fading out, and W1, 2, 3, 8 and 9 signals came through for more than an hour thereafter. We heard our last aurora signals at 0830, which is the latest we can recall hearing an aurora hang on into the morning.

Activity on 220 Mc. in the Los Angeles area has reached the point where net operation is being started. K6GKX writes that the Inter-County Net convenes on 221.5 Mc. each Monday, Wednesday and Friday at 2000 PST. The first session had 15 participants and it is expected to at

2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked.

W1REZ	29	8	1175	W5CVW	11	5	1180
W1AZK	24	7	1205	W5NDE	11	5	625
W1KCS	23	7	1150	W5VY	10	3	1200
W1RFU	23	7	1120	W5ON8	9	3	950
W1AJR	22	7	1130	W5FEK	8	2	660
W1HDQ	20	6	1020				
W1MMN	20	6	900	W6NLZ	12	4	2540
W1IZY	19	6	875	W6W8Q	10	5	1390
W1AFO	17	6	920	W6DNG	9	5	1040
W1ZJQ	17	6	860	W6AJF	6	3	800
W1CLH	17	5	450	W6ZL	5	3	1400
K1AER	16	6	810	W6MMU	3	2	950
W1PHR	16	6	780				
W1BGN	16	5	650	W7VMP	11	5	1280
W1KHL	16	5	570	W7JRG	8	4	1040
				W7LHL	4	2	1050
W2CXY	37	8	1360	W7JIP	4	2	900
W2ORI	36	8	1250	W7JU	4	2	353
W2NLY	36	8	1390				
K2GQI	30	8	1200	W8KAY	38	8	1020
W2AZL	29	8	1050	W8WXV	35	8	1200
W2BLV	27	8	1020	W8LOF	33	8	1060
K2IEJ	25	7	1060	W8PT	32	8	985
W2AMJ	25	6	960	W8SVL	30	8	1080
K2DWJ	23	6	860	W8SFG	30	8	1000
K2HOD	23	7	950	W8LPD	29	8	850
W2SMX	22	6	940	W8EHW	28	8	860
W2PAU	21	6	724	W8WRN	28	8	680
K2CEH	21	8	910	W8BAX	27	8	960
W2LWI	21	6	700	W8DX	26	8	720
W2RXG	20	6	700	W8ILC	25	8	800
W2UTH	19	7	880	W8JWV	25	8	940
W2RGV	19	6	720	W8GFN	23	8	540
W2WZR	18	7	1040	W8NOH	21	8	975
W2ESK	18	5	850	W8LCY	21	7	610
K2RLG	17	6	980	W8BLN	21	7	610
				W8GTK	18	7	550
W3RUE	30	8	975				
W3GKP	29	8	1020	W9KLR	40	9	1160
W3KCA	28	8	1110	W9WOK	40	9	1150
W3TDF	28	8	915	W9GAB	33	9	1075
W3SGA	26	7	700	W9REM	31	8	850
W3FPH	22	8	1000	W9AAG	30	8	1050
W3NKM	20	7	730	W9ZIH	30	8	830
W3LNA	20	7	720	W9LVC	27	8	950
W3LZD	20	7	650	W9EQC	26	8	820
				W9ZHL	25	8	700
W4HJQ	38	8	1150	W9BPV	25	7	1030
W4HHK	35	9	1280	K9AQP	24	7	900
W4ZXI	34	8	950	W9PBP	23	8	820
W4AO	30	8	1120	W9LF	22	7	825
W4MKJ	28	8	850	W9KPS	22	7	690
W4UMF	28	8	1110	W9PMN	19	6	800
W4VLA	26	8	1000	W9ALU	18	7	800
W4EQM	25	8	1040	W9JIY	17	8	790
W4WNH	24	8	850	W9LEE	16	6	780
W4JCJ	23	6	725	W9DDG	16	6	700
K4EUS	22	6	765	W9DSP	15	6	720
W4VVE	21	6	720				
W4IKZ	20	6	720	WØSMJ	29	9	1075
W4OLK	20	6	720	KØEMQ	29	7	1110
W4AIB	19	7	840	WØIHD	27	7	890
W4CPZ	18	6	650	WØBFB	27	8	1060
W4TLV	18	7	1000	WØGUD	25	7	1065
W4RFR	18	7	820	WØRUF	23	7	900
W4MDA	17	6	650	WØINI	21	6	830
K4VUX	16	6	830	WØUOP	21	7	900
W4CLY	15	5	720	WØTGC	21	7	875
W4LNG	13	5	800	WØZJB	18	7	1180
W4RMU	13	6	920	WØRYG	17	6	925
W4KCQ	10	4	860	WØIFS	16	6	1100
W4GIS	9	2	335	WØJHS	13	5	700
				WØIC	12	6	1240
W5RCI	33	9	1215				
W5DFU	25	9	1300	VE3DIR	28	8	1100
W5AJO	22	8	1280	VE3AIB	26	8	910
W5KTD	22	8	1200	VE3HQN	19	7	790
W5JWL	21	7	1150	VE3AQG	17	7	800
W5LPG	19	6	1000	VE3DER	16	7	820
W5VKH	15	5	730	VE2AOK	13	5	550
W5ML	15	5	700	VE3BPB	14	6	715
W5PZ	14	6	1255	VE7FJ	2	1	365
W5FSC	12	5	1390				
W5HEZ	12	5	1250	KH6UK	1	2	2540

least double this when it gets rolling. Traffic and emergency operation are emphasized.

The World Above 1000 Mc.

Here are more details of the 270-mile record set during the September V.H.F. Party week end by W6MMU/6 and K6AXN/6. Don, W6MMU, set up on 8831-foot Mt. Pinos. Mike, K6AXN, with the help of W6V8V, was in business on Mt. Diablo, a 3849-foot elevation east of Oakland. Contact attempts were started around noon Sept. 20, and continued, without success, until 2300, when the boys decided to call it a day.

A 2-meter liaison circuit had been provided, but this failed when W6MMU's 2-meter linear amplifier developed a short, blowing the rectifiers and power transformer in the high-voltage supply. The Communicator alone was not of sufficient power to maintain consistent communication direct, but part-time liaison was available through W6BUT at Taft.

W6MMU/6 started up at 0730 the next morning, not knowing if K6AXN/6 was in operation or not. Don heard Mike's 1296-Mc. signal first at 0802, but two-way communication was not established for another 15 minutes. Signals were weak most of the time, fading into the noise on occasion, so the entire operation was carried out on c.w. After the first hour or so of work tests were continued with automatic keying, until about 1015, when signals disappeared for good.

The contact began on vertical polarization. In the course of arranging to change to horizontal they inadvertently worked for some time with cross polarization, without realizing it. When this was discovered, signals had faded deeply, but satisfactory communication was restored when both stations were horizontal. This proves nothing about polarization, except that it was shifting — and that polarization diversity systems might well give considerably improved results over long u.h.f. paths such as this.

There were also some direction peculiarities observed over this obstructed circuit of 270 miles. One way the 144-Mc. signal was best on a direct line between the two paths, while the 1296-Mc. signal peaked 10 degrees to the east. In the opposite direction these conditions were reversed as to band! This anomaly was checked out on both vertical and horizontal polarization.

More activity by members of the San Bernardino Microwave Society is reported by W6OYJ. On Sept. 28 W6SDE/6, Corona, Cal., worked K6MBL at Pomona on 3500 Mc. This is some 16 miles, with the Chico hills intervening. The Corona site was a small knoll, but the path to Pomona is not line of sight. W6OYJ/6, set up at the same site, also worked K6MBL. The two stations then moved to the home of W6SDE, and set up on the roof. At that point, some 200 feet lower than the first spot, no signal could be heard from K6MBL, though contact was maintained on a 144-Mc. liaison circuit. W6SDE then swung his 21-inch parabola around toward W6VIX in Ontario, whereupon two-way communication was established over the 14-mile distance.

This is a line-of-sight circuit, but it is a 3500-Mc. "first" in that it was two-way work between home stations. Equipment used was the polaplexer system described in June *QST* by W6BGK. Parabolas used by W6VIX and W6SDE were 21 inches in diameter. W6OYJ used a 29-inch dish and K6MBL a 40-inch one.

Putting the DX-35 on 50 Mc.

Seems everyone wants 6-meter conversions for commercial transmitters these days. Such conversions are not worked out at ARRL Headquarters, and unless someone does the job and sends us his step-by-step procedure we cannot supply conversion information. We've run 6-meter conversions for the Viking I (Dec. 1952), the AT-1 (May, 1957), the Adventurer (Sept. 1958), and the DX-40 (Aug. 1958, page 146). A Ranger conversion article is in the works.

Here is a simple step-by-step routine for putting the DX-35 on 6, sent in by K2VIN. Changes are made by cutting out the 10-meter band, but replacement of it at a later date should not be difficult. The 10-meter coil has 4 turns; cut it down to 2. Make a new grid coil for the 6146, using 9 turns ¼-inch diameter, same length as the original. Bypass the low end of the 6146 grid resistor. Tune the oscillator plate circuit to twice the frequency of the crystal, which should be in the 8.4-Mc. range.

The second 12BY7 triples to 50 Mc., driving the 6146 straight through. Tuning is similar to that on lower bands, but the operator should be sure that he has the right harmonic at each tuned circuit.

V.H.F. Sweepstakes — Jan. 10–11

The major contest event of the v.h.f. man's year is the V.H.F. Sweepstakes. Normally held the first week end in January, it was moved to the second this year to space it out a bit from the holiday week end. One change in the rules is made for the 1959 contest. A major inequity that came to light for the first time last year has been removed. Contacts can be made between different time zones only when the contest is under way for *both* zones. If we get an F_2 opening Saturday afternoon the East Coast will not be able to clean up at the expense of the West. Details elsewhere in this issue. Reserve that second week end in 1959 right now!

OES Notes

W1EUJ, Tyngsboro, Mass. — A 50-kw. station is about to go on the air on 49.6 Mc. in Waltham, Mass. What will this do to the 50-Mc. band in the area?

W1EXZ, Danville, Vt. — Working into Maine daily on 50 Mc., presumably due to obstacle gain over the White Mountains. Worked K1CXX, Auburn, Me., nightly while he was rebuilding his regular home rig and was using only 7½ watts. W1QIG, Standish, Me., also worked over the Presidential Range when he was using 8 watts. These are 100-mile paths.

W1LGE, Windsor Locks, Conn. — First 50-Mc. opening across Atlantic Oct. 14, more than a week ahead of previous record. European video signals up to about 50.6 Mc. that day.

W2LWI, Wappingers Falls, N. Y. — Hearing video signals from East (Africa?) on 50.4, 50.8 and 51.8 Mc.

W3GKP, Spencerville, Md. — Earth potential measurements continue. Highest thus far recorded ranged from minus 3.9 to plus 4.0 volts, July 8.

K4KYL, Knoxville, Tenn. — Stations now active within reliable range number close to 200. Activity in prospect on 220 Mc. also.

W6OYM, Sherman Oaks, Cal. — Continuing mountain peak reflection and refraction experiments reported last month. It has been found that maximum refraction signal over a ridge or peak occurs when the two stations are approximately the same distance either side of the mountain. Installation of a half-wave rod at the top of the obstruction makes it possible to vary the distance of the communicating stations from the mountain considerably without appreciable loss of signal strength, so long as both are in line of sight to the reradiating antenna.

W6PBC, Belmont, Cal. — Oscillator-amplifier with resonant cavities tuning 400 to 1300 Mc. built and in use. K6AXN, W6VSV and K6ONM all working regularly on 1296 Mc.

K9GAJ, Fond du lac, Wis. — Put s.s.b. on 50 Mc. with 6360 mixer and 10B. Managed to work East Coast stations during sporadic-*E* opening with this very low output.

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Correspondence From Members-

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Cadiz, Ohio

Editor, *QST:*

My OM and I are both Novices, and we are working for our Generals. In October *QST* there is a letter (from a Novice, of all things!) saying c.w. is a primitive and obsolete method of communication. We must disagree with that wholeheartedly! C.w. goes farther, the equipment is cheaper to build, and it is universally understood. There is also quite a feeling of satisfaction to mastering the skill of a "good fist".

— *Ann O. Warren, KN8LGA*

829 E. Mitchell Avenue
Cincinnati 29, Ohio

Editor, *QST:*

I was once a Novice like KN6LXA, and like him, I hated being on code all the time and counted the days until I would get my General. I got it; and got on phone. I found out then that a phone signal takes much more bandwidth than c.w. signals. Where phone couldn't get through the QRM, c.w. could. After many hopeless months on phone I have returned to the lower portion of the bands and have a better time ragchewing with a Novice or another ham in Ohio on c.w. than trying to break the fone QRM.

— *Charles H. Benet, K8DNH*

868 E. 7th Street
Brooklyn 30, New York

Editor, *QST:*

KN6LXA probably thinks that because he is having no end of trouble with the mastery of the code it is unnecessary for the amateur license exams. I, too, am having considerable trouble with the code but I recognize its importance, even though I wish I didn't have to know it. If code was an obsolescent mode of communication I am sure the FCC would have eliminated it from amateur exams a long time ago. If he is so dissatisfied with c.w. I suggest that he just give up operating on code on the Novice bands and go on 2 meters until his license expires and then he will be rid of c.w. once and for all. Then he will have nothing to complain about.

— *Kim Boriskin, KN2MGS*

7504 Mt. Carmel Road
Pittsburgh 6, Pa.

Editor, *QST:*

You are to be commended for your equity in printing the snarling attack on c.w. by KN6LXA. One might wonder where a Novice gained the experience and knowledge to make the ridiculous statement that c.w. is obsolescent.

Obsolescent, indeed! Dollar-for-dollar and watt-for-watt, it is still the most efficient and accurate form of radio communications. . . .

— *Steven Morosa, K3AGF*

9 Bennett Street
Canisteo, N. Y.

Editor, *QST:*

. . . In my job I am talking all day and it is good to be able to communicate with others and yet keep my mouth shut.

— *Duane H. Harris, K2PFC*

Athens, Ohio

Editor, *QST:*

I like c.w. but I wouldn't want to see you rascals thrown out just because you won't pull for strictly c.w. and no phone. Where would the hams be today without what the rascals at ARRL have done and are doing today for *all* hams?

— *E. J. Greer, K8CKW*

20 Orchard Road
Maplewood, New Jersey

Editor, *QST:*

If ARRL had been pampering c.w., I am sure that hamdom would have risen long ago to throw you "rascals" out. It says on my 20 w.p.m. Code Proficiency certificate: ". . . in the basic art of the true amateur, reception by ear of the international morse or continental code . . ." I don't think truer words have ever been spoken. Thousands of amateurs are struggling to obtain such certificates. . . .

And better watch out whom you call rascals. If it weren't for the League, our hobby could not exist.

— *Paul Gili, W2OPB*

TECHNICIANS

Phoenix, Arizona

Editor, *QST:*

I have run across quite a few General Class hams on the low bands who are constantly complaining about the Technician class of license and they seem to think the FCC should require a faster code test, a harder written examination, etc. You can usually find the majority of the Technicians on 6-meter phone, ragchewing and having a good time. It seems silly to require a 13 w.p.m. code test of these boys because I doubt seriously if many of them would use c.w. to any great extent. It seems so many of the General Class hams have absolutely no love for the Technician regardless of who he is. Yet, how many of these Generals have ever tuned 6 meters? I have found these 6-meter boys to be pretty decent fellows. These guys on six are enjoying themselves. Why don't we leave it that way? Let's live and let live.

— *Rae A. Echols, Jr., W7FFF*

6341-A Maple Street
University City, Missouri

Editor, *QST:*

I'm not acquainted with v.h.f. operation in New York so am speaking only of the Greater St. Louis area: the Technician has put 6 meters on the map. Six meters here in St. Louis was dead until it was turned over for use by the Technicians. The Air Force Ground Observer Corps in St. Louis is supplied with radio communication by the amateurs on six meters by 44 mobile and fixed stations of which 90% or more are "Video Rangers". As far as experimenting is concerned we wonder how much more experimenting is done by the generals? Here in St. Louis the technicians are doing the following: TV on 420, two-way on 220, RTTY on 50 Mc., etc. I have always been under the impression that the Generals and Technician Class exams were identical except for the code.

— *John F. Steffen, KØBVL*

39 Victoria Avenue
Buffalo 14, New York

Editor, *QST:*

I am more than a little tired of the treatment we Technicians seem to have to take from the General class. Just where do they think they fit? I wish to remind these lads that we Technicians have taken the same exam they did with the exception that we didn't pound the brass as fast as they did once upon a time. Radio operators exams have become increasingly difficult since most of these lads took theirs. I wonder how many of them are sharp enough to sit down right now and pass the new exams now, even without the code test. I'd be willing to bet, with all their loud boasts, that over 50% of them couldn't re-pass that 13 words a minute if we slipped in on them and gave them a test today.

— *Robert E. Kleasen, K5QQA, WA2BYZ*

7103 Oak Park
Fort Worth 18, Texas

Editor, *QST:*

I don't know what the Technicians pull in "Yankee Land" but I can sure speak for Texas and that is we have

(*Continued on page 190*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.

GEORGE HART, W1NJM, Natl. Emerg. Coordinator
ROBERT L. WHITE, W1WPO, DXCC Awards
PHIL SIMMONS, W1ZDP, Asst. Comm. Mgr., C.W.
LILLIAN M. SALTER, W1ZJE, Administrative Aide
RONALD GANN, W1FGF, Club Training Aids
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., Phone

Alaska Also to Remain Valid for DXCC. In this department of September *QST* we announced that Alaska would be a *49th state for WAS* when we can announce the legal date by which it officially becomes administratively part of the Union. This is expected to be sometime after the November general election. Stateside and internationally too, Alaska has been sought eagerly for many years in view of its having "country status" in the ARRL Countries List as do other territories at very considerable geographical distances. This DX qualification will remain valid too when Alaska achieves statehood.

Since some may wonder about the basis for examining areas for eligibility to the ARRL Countries List, let us review the considerations customarily weighed by the staff committee in such cases. It has been over three years since we publicized the criteria (page 68, May '55 *QST*) on which the ARRL Countries List is based. After consulting the topmost political and geographical authorities for facts, the points examined are (1) degree of political-administrative independence, (2) geographical separation, and (3) does the area have "foreign lands between." Note that making Alaska a state makes *no change* in the latter two criteria. The consideration of remoteness (and Canada between) gives heavy geographical country-implications for Alaska. It should be noted that statehood likewise will increase the weight of political autonomy so that its list-status is thus also strengthened rather than weakened. This is to report that Alaska passed the review of the advisory staff on country-status for DX (operating aid 7) with flying colors, so will *not* lose this status for DXCC.

For the February-March '59 ARRL DX Contest. Invitations to amateurs in *other* nations are now being mailed. This competition's rules have to be printed before the results of Alaska's November vote to put statehood legally in effect can be known. This would be too late to make contest changes in Alaska's status even if there were good reasons. It clarifies matters to say that in any DX activity, such as the ARRL Feb.-March DX Test, Alaska is considered in her capacity as "an ARRL Country" and not as a state. Deviation from the familiar DX contest pattern would result in overseas misunderstandings and operating confusion. Looked at globally, any change to shift more stations from the DX side to the domestic side would accentuate an existing imbalance, make worse pile ups and a less happy contest operating condition for the majority who take part. Alaska, Hawaii, etc. are authentic listings for a DXCC or the ARRL DX Contest count. So this is just a reminder that Operating Aid No. 7 will be followed; W's and VE's should count Alaska as a countries-multiplier in the coming DX test. Here's where in this coming contest you *may* get a country and a new state at the same time!

Call for Official Observers. A standing League policy requires maintenance and extension of the Observer service. The primary work of OOs is to help keep you and me and other amateurs clear of citable FCC difficulties in connection with our signals and operation. Activity in mailing the standing observer-type forms, to alert active amateurs, wherever necessary, to look into their difficulties, and accept the responsibilities imposed by FCC regs is required to be an OO. SCMs having completed their fall overhauling of appointments to show *activity*, are currently looking for experienced amateurs to replace some who have been dropped from the lists.

Observer appointment is not for newcomers. An SCM may give it only to a General Class or Conditional Class (or above) operator who is regarded as having requisite experience and equipment with know-how in checking for images, transmitter stability and the like.

We'll gladly send more information on the Official Observer duties, policy, and sample forms in answer to radiograms or other inquiries. The four kinds of Observer specialties include two grades of frequency precision observers as well as the field-of-activity for c.w. (and RTTY) and the phone signal observing. The League's Board of Directors in recent annual meetings have commended active OOs on their results. W1JNV, W2BLP, W3BJI, W4MGT, W5BKH, W6ADB, W7SFK, W8GFE, W9GFL and KØDEX were reported favorably to the Board at the time of the last annual meeting, as the leaders for their licensing areas in this cooperative program.

In addition to the assistance rendered brother amateurs (and a file of honestly thankful letters attests to the popularity of the service), the OO program helps make our operation a self-monitoring and well behaved service such as in keeping with our high traditions. That this is so is attested by a very recent quotation coming from the FCC itself. "On behalf of the Field Engineering and Monitoring Bureau, I am pleased to

acknowledge the fine work that the Official Observers are doing in the interest of self-regulation within the Amateur Service." — Geo. S. Turner, Chief, Field Engineering and Monitoring Bureau.

If you can devote some regular time to OO work, it can help the newcomers and maintain a high level self-service for all amateurs. Standing Information is made available to OOs on receiving appointment from one's Section Manager. For those in a position to make application: Your SCM's full address will be found among those on page 6, this issue of *QST*.

Phone Operation Out-of-Sub-Band Draws FCC Suspension. Starting with July *QST* we have felt obliged to report in these columns the FCC Amateur Operator License suspensions of more than a dozen different amateurs for various serious infractions of the Amateur Service regulations. The license suspensions were of varying length, from about two months to three and one half years. The six month suspensions for running in excess of one kilowatt input power (included in the list) were the first recorded in *QST* for some three years. We present briefs of pertinent FCC orders not only as news but to indicate ethical and regulatory practices that other amateurs should take great care to avoid. We're obliged to add to the list this month. The several different causes for recent FCC license suspensions might first be carefully noted, however: (1) For helping another to get a license by fraudulent means. (2) Operating in excess of the legal 1,000 watts input to the final amplifier. (3) For setting an illegal station in operation. (4) For operating at a fixed station location other than authorized by one's license. (5) For using a self-assigned call and work by voice (by Technician or Novice) in the 3.8 or 7.2 Mc. phone bands. (6) For operating *after* the Novice License expired. (7) For failing to keep a proper log. (8) For failing to post license, and (Novice) using the calls of other stations on the 50–54 Mc. as well as the 144–148 Mc. band.

FCC ordered (August 8, 1958) that the General Class amateur operator license of Jerry A. Spies, Columbus, Ohio BE SUSPENDED for the remainder of the license term which expires May 7, 1959 (about 9 mo.), and that the license be turned in to FCC, *it appearing that the licensee* by operating his amateur radio station W8QDH with A-3 emission on the frequency 21243.78 kc. which was not available for A-3 emission violated Sec. 12.111(e) of Part 12, FCC Rules, and that he violated Sec. 12.155 of the same rule part in failing to respond to official notices of the foregoing violation.

The Holiday Traffic. We have spot activities for almost every season. However, it is the appeal of exchanging greetings of various sorts, using the message handling side of our amateur radio that is intriguing and a challenge and an opportunity as Thanksgiving and Christmas arrive on the scene. Newer amateurs can well use this season to demonstrate to themselves and others that their stations are truly capable of sending off some messages, for themselves and their families and others. To any experienced amateur worthy of the name, the process of setting down a message in the form it should be transmitted and getting it on its way from his station should be purely routine. However, to some with little general amateur experience, and no traffic know-how at all, let us offer a few suggestions to help you get in on this Christmas traffic.

Within the United States and Canada we amateurs are fortunate to be able freely to relay and deliver messages, holiday or other, so long as there is no form of compensation, or direct or indirect benefits from our station's work (FCC Sec. 12.102). This is one of the privileges not generally permitted amateurs in most other countries, where radio communications are run as a government monopoly. Those who draw up regulations in other countries probably never stopped to think that the essential difference between a voluntarily handled message and the commercial one is that in the latter the carrier has to *guarantee* delivery and a good grade of service. It should be said (to ourselves) just in passing, that the appreciation of those who receive *any* messages, in any service, amateur or otherwise, depends on the accuracy and speed and reliability in delivery. So without being able to offer guarantees on behalf of the reliability of the "other" thousands of amateurs, we all do want to be one with that outstanding group of amateur communicators who have made accuracy and sure delivery the tradition, though depending entirely on self-developed know-how and voluntary means.

We must leave the soliciting of your private messages for yourselves and others to you. The message form, if you don't already know it, can be copied right from page 11 of *Operating an Amateur Radio Station* or set up by putting the various radiogram parts down on one of the official ARRL message blanks. This will automatically place the elements in the right order to send. Our purpose here is to outline the steps you may take to get your message to another part of the country efficiently by amateur radio.

The Ways and Means. We must recognize (alas) that in a body as large as ours, *not* all amateurs are equally skilled communicators; some just have interest in technical hobby aspects or are technicians with limited station range and frequencies. (1) The first thought is usually *to*

NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

handle the message direct. If you have or can make a schedule with the point of destination with a dependable outlet there, you have it made. To find a reliable operator at the place of destination you may want to look in *QST*'s Station Activities for the calls of traffic stations in the area, or you can listen for "actives" and look up the likely prospects in your call book. (2) An easier solution is to *file your amateur radiogram with a local amateur* who is an ORS or OPS and has long specialized in sending and receiving messages and knows the ropes. (3) But it's easiest and usually most reliable *to start our message on the local ARRL Section Net* — one which connects daily through liaison stations with regional and area nets of the National Traffic System. This net frequency and time of operation will be shown in your own section's Station Activities report in many cases; also look it up if necessary in the Net Directory issued annually by the League in printed form. Get on the net, call the NCS indicating you have traffic (and where for), and stand by until the net control station (NCS) tells you what station to give it to. When this station receipts to you for your traffic it is well on its way! (4) A possible variation of this system is to consult the net directory for the time and frequency of a net in or near the place of destination, and to report directly to its NCS. The conditions and limited distances under which casual reporters can successfully break into nets not their own make us suggest that while this is possible, it is ordinarily not the best practice. The main principle to insure the best speed and accuracy on your traffic is to so handle it along the above lines that it will be relayed and delivered by those amateurs who day after day find their fun and enthusiasm in this part of our hobby. Your amateur station can easily be part of this group, and thus part of NTS. The capable instrument of our ready-made traffic net will see your traffic through; by joining it (it takes just a little time each week) one can hardly help becoming a more capable communicator as well as a member of a fine fraternal group.

Numbered Texts and the ARL Check. To assist amateurs along the traffic networks in doing the biggest job with the shortest transmission time, especially in holiday seasons, a list of fixed or standardized texts has been devised. Every League logbook contains in the back a complete list of the *ARRL Numbered-Text Messages.* These are suited especially to emergency work use and holiday needs, when a peak load of amateur traffic bears seasonal greetings, as always at Thanksgiving and Christmas time. For anyone who doesn't have a log that includes such a list of standard messages from which a selection can be made by the sender, you are welcome to one gratis, with the compliments of ARRL, if requested by radio. We'll be glad to send this list, CD Form 3, printed on the back of a number-sheet (for the next year's consecutive numbering of any messages you start) if you will but send us an amateur radiogram, via NTS or other net, asking for same. Directions and necessary precautions in using them are given with the list of fixed texts. As an identifier that such a message is coming an ARL appears in both the check and in the text preceding its identifying numeral. We recommend *spelling out* these and other numerals, always, so that the so-easy-to-make errors will not be made. For Christmas and New Year the 50–70 block of texts is available for your selections. Putting the ARL indicator directly ahead of *each* number in a text prevents running numbers together if more than one text is transmitted. When one gets a numbered-text message for delivery it is his responsibility as receiving operator always to expand the message and spell it out, since the numbers are merely the system designators, within amateur radio, for those meanings. The numbered-text principle is to facilitate general communication, not to obscure meanings, so the list is in keeping with what is permitted under FCC's Sec. 12.105. While we always prefer the individually-worded message, the ARL-system has helped amateur radio do a bigger seasonal job of handling greetings and emergency messages year after year. So refer to your ARRL log-book list as necessary or ask us to send one for seasonal use at your amateur station. Make it a traffic-Christmas by sending and receiving a few well placed amateur radiograms! —*F. E. H.*

A preliminary evaluation of the recent Simulated Emergency Test indicates a considerable increase in activity over last year. Reports are just starting to come in at this writing; we are keeping our fingers crossed and hoping that results will bear out our expectations. Which reminds us to remind you: have you sent in your SET report? About 1200 messages have been received from AREC members so far, and there are still more to come.

We want to say something here about "publicity." The SET has two principal objects: first, a test and evaluation of our AREC facilities in cooperation with the agencies we serve, be they Red Cross, civil defense, police, or whatever. The reason for this is to uncover imperfections in our setups and thus be able to take steps to correct them — and in that connection a critique after the test is called for. Now a critique is not a back-slapping or medal-awarding session, and it is not a vehicle for ballyhoo publicity. It is an honest effort to determine how to correct whatever is wrong; and *no* organization is perfect.

The second objective is to demonstrate our services to the public. We list this second because it is second in importance — which isn't the same thing as saying it is *unimportant.* On the contrary, publicity is very important, but let's put first things first, and the first thing we must accomplish is to render a service, the best possible, most efficient service of which we are capable, whether anyone knows about it or appreciates it or not. Then and only then can we seek publicity, praise, flowers and other rewards, tangible and intangible, for our efforts. Most efficient AREC organizations will find that efforts to obtain publicity are unnecessary. It comes spontaneously with service rendered. We have no brochures on "how to obtain publicity for your AREC group." All we have is information on how best to render an efficient service.

On numerous occasions we have received requests (sometimes demands) for "publicity in *QST.*" Information accompanying such a request is sometimes usable, sometimes not. The decision is usually an editorial one — that is,

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

These frequencies are employed throughout the United States by amateurs using radioteletype.

whether or not the subject is considered to be of enough interest to enough *QST* readers, based on subject matter, illustrations, style, and general readership. This kind of "publicity," if it appears in this column at all, usually rates a rather low priority, because this column is not a publicity column. It is a chronicle of amateur achievements in emergency communications. What publicity results is inherent in the account of services rendered — first, in an actual emergency, second, in a test, drill or public activity, and third, in plans and preparations for rendering an emergency communications service.

This is not to say that descriptions of AREC or RACES setups are automatically thrown out the window. Oh, no! They are considered for "up front" publication in *QST* but as mentioned above, strictly on an editorial basis. Many such articles have been printed, and we are always on the lookout for more. If you have an organization of which you are proud (and we hope you have), write it up in some detail, send along some pictures (of *amateurs* and their equipments) and other illustrative material. We earnestly solicit such material and will be delighted to consider it for *QST*, but promises of publication we cannot make until we have seen it and studied it.

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It seems that we no sooner set up our list of SECs for publication in October *QST* than a number of changes were made by SCMs. So please correct your October *QST* lists as follows: The Western Florida SEC is W4PQW (our apologies for this one — he was inadvertently left out); for Md.-Del.-D. C., change W3CXG to W3YYB; for Rhode Island, change W1PA to W1PAZ (this one was our fault too); for Idaho, change W7IWU to W7OCR; for West Virginia, change W8KXD to W8HZA; for Canal Zone, change KZ5RB to KZ5RV (bad proofreading); for Northern Texas, change W5BNX to W5AEX; for Oklahoma, change W5LXH to K5KFS; for Indiana, change W9CMT to W9SNQ; for North Dakota, change W0CAQ to K0JLW; for Santa Barbara, delete K6CVR (no replacement as yet).

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On Sept. 9, units of the Berrien County (Mich.) AREC were alerted at 2215 EST by the Red Cross, following news that a wind and rain storm had completely disrupted communications in the village of Hartford, Mich., 20 miles northeast of Benton Harbor. Two Berrien County Emergency Units were alerted immediately, one on 6 and the other on ten meters. At 2230, five mobile units were en route to the scene of the emergency. By 2255 communications had been established in the stricken area and between Hartford and Benton Harbor. News releases were handled and traffic between the stricken area and Red Cross headquarters in St. Joseph was handled by the two nets, one on 6 and one on 10 meters. The last mobile unit left the area at 0100 Sept. 10, when limited telephone service was established. Up to that time, the amateur mobiles had been the only means of communication with the stricken areas. The following mobile units took part: *W8s* QQO TWS, *K8s* BLL LAP ADS. Two additional mobiles were standing by but were not needed. — *W8QQO, EC Berrien Co., Mich.*

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Orange County, Texas, experienced a rainy September, but the 4-inch deluge on Sept. 20 caused the Sabine river to overflow and create serious flooding conditions. EC K5BJB was called by the local club president at 0500 on Sept. 21 and told that Orange was under 2–4 feet of water. The Orange Amateur Radio Club went into action. W5NMV was used as net control, with W5ICL operating. Other stations were put on the air from Central Fire Station (K5PUD), from the Red Cross (K5RTR), from Stark High School (K5ROA and K5RJQ), from radio station KOGT (K5HMB and K5PIH), from the U. S. Naval Base (W5EXK) and from the National Guard Armory (K5OSX). K5EVE and K5RAE stood by in Orangefield. Club station W5ND was manned by K5PUH and K5OYJ. Mobiles in motion were *K5s* ROB SCU PUE and BJB. Relief operators were *W5s* OQG SOA and QLE.

Telephone service was overloaded or completely out in many places. Communications handled by the amateur group had to do with evacuations from flooded areas, arrangements for food and shelter, and delivery of messages to places which were without communication. One mobile took a doctor out to deliver a baby. All highways to Orange were closed until the following day. By 1600 on Sept. 21 things were getting back to normal so we all went home feeling satisfied that amateur radio had done another good job of emergency communication. — *K5BJB, EC Orange County, Texas.*

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The Florida Midday Traffic net was interrupted on August 9 when K4SZC reported that W4HCG had been overcome by fumes from a chemical compound he had been using. The details of the efforts of the net members to ascertain just what had been in the poisonous compound and how it should be treated, involving doctors and hospitals as well as chemical distributors, are too long and involved to go into here. Suffice it to say that through the efforts of the net the necessary information was obtained and the stricken man properly treated. Twelve net members took part in the activity, along with a number of monitoring stations who broke in with helpful suggestions from time to time. — *K4AKQ, FMTN Manager.*

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Eight amateurs of the Warren County (N. Y.) AREC group assisted in providing communications for the 88-mile marathon boat race on Lake George, Aug. 17. Units were all operated mobile and were located at key spots on the lake, maintaining constant contact with the judges and radio

Members of the Los Angeles County Disaster Authority RACES group put on a public display of amateur radio at the Los Angeles County Fair, Pomona, Calif., Sept. 12 to 28. Operation was by phone, c.w. and RTTY, 1¼ through 160 meters. Shown at the operating position are W6ONC, chief radio officer; K6OQD, radio officer San Dimas District; and K6AXC, deputy communications officer. *Official photo, Los Angeles Co. Sheriff's Dept.*

The Galveston County (Texas) Communications trailer is equipped for 2, 6 and 75 meter RACES operation, with a 5-kw. generator trailing. Shown posed in front of it are: W5QJD, alternate r.o.; Rusty Thomasson, communications head; W5WYK, alternate r.o.; W5JSU, r.o.; K5EHZ, alternate r.o.; and Col. J. T. Cain, county c.d. director.

station WIPS. — *K2EED, EC Warren Co., N.Y.*

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Members of the Cascade County (Mont.) AREC, all of whom are also members of the Great Falls Radio Club, provided communications during the annual Junior Chamber of Commerce Trout Derby on Aug. 24 along a 12-mile stretch of the Missouri River. Mobile and hand-carried units patrolled the river to report fish catches, direct traffic and provide transportation for officials. W7WRK acted as control station, and EC W7ZUQ collected information on the activity and submitted it to radio stations and newspapers. Thirteen amateur stations participated. — *W7KUH, SEC Montana.*

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Amateurs from Fort Walton Beach and nearby Eglin AFB, Fla., assisted the Fort Walton Police Dept. on Labor Day week end in handling communications during two parades, one on Aug. 30 and the other on Sept. 1. A portable station was set up next to the police dispatcher in City Hall, operating on 29,560 kc. by W4BPJ and K4JUA. Mobiles were positioned at various intersections, plus an additional mobile in the parade itself to report parade progress. The seven amateurs who took part are all members of the police auxiliary and will be called on for similar jobs in the future. — *W4RKH, SCM W. Fla.*

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The Arlington County (Va.) AREC just received a 3500-watt and three 2500-watt emergency power generators, with more on order along with some other equipment. The aim is to have two duplex RTTY stations, a central control station complete with towers, and a communications trailer. The RTTY equipment will be for handling traffic to out-of-county points. This equipment *all belongs to Arlington County AREC!* It is part of a preparedness plan for Arlington County AREC initiated and supplied by the amateurs themselves and spark-plugged by WØRKO/4 and EC K4MJZ. The AREC members are doing it themselves, supplying their own equipment and facilities. Last winter, Arlington County had 100,000 homes without power and 10,000 without telephones during stormy and snowbound conditions. This year, the AREC will be prepared.

It isn't easy to work up an organization like this without subsidy by some government or commercial organization. Our hats are off to K4MJZ and his gang for showing that it can be done without help where the need is apparent and there is no other amateur facility organized.

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We received twenty SEC reports on August activity, representing 6095 AREC members. This is 'way below the record-breaking 27 reports for 7009 AREC members we received in August of last year, but it beats August of 1956, if that's any consolation. Reports were received from the following sections: W. N. Y., New Mex., Conn., Minn., San Joaquin Valley, Ga., Mont., E. Fla., Wis., East Bay, Santa Barbara, Colo., Ala., Santa Clara Valley, So. Texas, NYC-LI, Wash., E. Pa., Maritime, Ont.

A note to SECs: don't be so lazy. A report that is scrawled "same as last month" is not a report. Fill it in, will ya, huh? If you're not making any progress, at least fill in the numerical data so we don't have to go to our back-report file to find out how many AREC members you have. In the case of one section, we discovered that the SEC has been scribbling "same as last month" on his reporting form for a year and a half. This is a report?

RACES News

During the late lamented SET, we were glad to note a greatly increased participation on the part of OCDM, both at regional and national level. We think that, for the most part, they received enough traffic to make the effort worth their while. Details of this and other participation in the SET in the subsequent *QST* writeup, but meanwhile we wanted to mention that OCDM Regions One, Three, Four, Six and Seven took active part in the SET on the National Calling and Emergency Frequencies, and we have already received rundowns from the respective communications officers of some of those regions on their participation. National OCDM headquarters at Battle Creek, Mich., was also represented during the week end. This demonstrates a high degree of RACES-AREC coordination at the federal level which we find most gratifying and which inevitably must result in a better all-around emergency communications service in the PICON. So, fellows, get your AREC and RACES programs together at your level, if they are not already in close accord. Parallel or competing services cannot possibly do the job as well as two services working as one.

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During the three-day Labor Day week end the Burlington County RACES participated in a combined mobile drill and public service when, on August 29, ten amateurs assisted in patrolling the highways. The station at the county's RACES headquarters in Mt. Holly served as net control station, and liaison was maintained with sheriff's radio cars as well as with state and municipal police in the county. When two meter mobiles were out of range of the NCS, fixed relay stations were used to provide the contact. Amateurs in their mobiles had no authority except to report, but some carried police officers. Several alerts regarding stolen cars were made available to the RACES mobiles, and in one case an abandoned car was discovered and investigated. Eleven mobiles were active, while six operators manned the control station. Three amateurs served as relay stations, and five additional stations reported into the net. The activity was organized by W2WKI, radio coordinator for Burlington County C.D.

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Washtenaw County (Mich.) Civil Defense held a mass evacuation of two townships on Sept. 7, in which RACES was assumed to be the only means of communications available. All seven zones of the c.d. setup were hooked up on 2 meters. Eighty-four messages were received from headquarters, 97 were delivered at headquarters and sixteen were on the hook at the close of the drill. The c.d. bus was stationed on a hill in Ann Arbor, about 2 miles from the county building and handled all traffic emanating from the county building on two separate two-meter frequencies. A few mobiles were also working on ten meters. — *W8JYJ, RO Washtenaw County, Mich.*

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Los Angeles County RACES had another large-scale operational test on Sept. 28, called "Operation Black Top II." Emphasis in this exercise was on controlling mobiles from other mobiles and portables representing c.d. headquarters. RACES groups from the cities of Los Angeles, Beverly Hills, Burbank, Long Beach, Claremont, Covina and Pomona also participated, involving over 225 mobiles and over 500 individuals, piling up an aggregate mileage of over 1200 miles over an area approximately the size of the state of Connecticut. Operation commenced at 1200 when mobiles and portable units reported to their local disaster stations. From there they proceeded to seven staging areas, where the smaller units were joined into major convoys. These convoys then proceeded to the assembly point in the

San Gabriel mountains, maintaining intercommunications en route, also receiving instructions and reporting progress from "Operation Command." Despite long distances and varied terrain, contact was maintained at all times. Operation Black Top II was developed by W6QJW, deputy chief r.o. for Los Angeles County, and was implemented by W6ONC, chief r.o., and carried out by county staff radio officers W6AEJ, K6VJU, K6AZJ and K6AXC. W6KQ, director of communications for Los Angeles County, also participated.

With over 600 members and an average weekly check-in of over 400 units, the Los Angeles County RACES group claims to be the largest in the United States, and the success of Operation Black Top II was largely due to the work of its district communication and radio officers who deserve to be named here: *W6s* WYH ILW UTY ORM TLI MCV TTN QYY POP GWO MTI NTN GHJ PNN EVL LVX SVU QYW EAH SEE, *K6s* SSG EFU ICD OPD and ABN. W6LIP commanded operational area "A", including the cities of Los Angeles, Santa Monica and Beverly Hills. The Burbank unit was commanded by W6JYP. Operational area "D", including Claremont, Covina and Pomona, was under W6PQH. — *W6QJW, Deputy Chief R. O., Los Angeles Co. Disaster Authority.*

Here is the station of G. W. Carson, W9LLZ, Asst. EC in Chicago, who runs a net on 147.5 Mc. in that area containing 35 members. The big relay rack contains the 2-meter gear using a commercial exciter and a home-brew final running 550 watts input. Equipment is also available for operation on 29,640 kc.

A.R.R.L. AFFILIATED CLUB HONOR ROLL

This Honor Roll is published as a special recognition for all affiliated clubs whose *entire membership* consists of members of the League. We are here pleased to present the second Honor Roll listing for 1958. See page 96 of June *QST* for the earlier listing of those affiliates with 100 per cent ARRL membership. Our honor list is prepared each time on analysis of data received in connection with each club's returned early-'58 Annual Report. This coming January or February a new survey form will be sent every active ARRL-affiliated radio club for the annual filings on which continued affiliation and our *QST* listings are based. These following Honor Roll clubs also now will receive our "100% ARRL Club" certifications following publication of this listing in *QST:*

Amateur Transmitters Association of Western Pennsylvania, Inc., Pittsburgh, Pa.
Bandhoppers Radio Club, Ferguson, Mo.
Blossomland Amateur Radio Association, Inc., St. Joseph, Mo.
Brawley Radio Amateur Club, Brawley, Calif.
Central Alberta Radio League, Alberta, Canada
The Central Illinois Radio Club, Inc., Bloomington, Ill.
Central Texas Amateur Radio Club, Waco, Texas
Chisholm Trail Amateur Radio Club, Inc., Duncan, Okla.
Coffee Dunkers, Detroit, Mich.
Concord Brasspounders, Concord, N. H.
Cranston Amateur Radio Association, Cranston, R. I.
Davenport Radio Amateur Club, Inc., Davenport, Iowa
Door County Amateur Radio Club, Sturgeon Bay, Wis.
Fountain City Radio Club, Fountain City, Tenn.
Illinois Valley Radio Association, La Salle, Ill.
Marshall Radio Club, Marshall, Minn.
Northeast Radio Club, Philadelphia, Pa.
Palmetto Amateur Radio Club, Inc., Columbia, S.C.
Queen City Emergency Net, Inc., Cincinnati, Ohio
Radio Amateur Club of Belleville, N. J.
Sandusky Valley Amateur Radio Club, Fremont, Ohio
Scott County Amateur Radio Club, Scott City, Kansas
Sunrise Radio Club, Inc., Cambria Heights, N. Y.
The Thirteen Amateur Radio Club, Vancouver, B. C., Canada
Treaty City Amateur Radio Assn., Greenville, Ohio
Valley Radio Club, Eugene, Ore.
Vanderburgh Amateur Radio Emergency Service, Evansville, Ind.
Victor Valley Amateur Radio Club, Victorville, Calif.
Wichita Amateur Radio Club, Wichita, Kansas
York Road Radio Club, Philadelphia, Pa.

TRAFFIC TOPICS

A lot of traffic was handled by a lot of amateurs during the SET, and we regret to say that some of it was handled pretty sloppily. One thing we have noticed is the frequent use of the word "same" in handling messages which have identical parts. The only time that this word should be used is when it actually appears in the message. Otherwise, it can lead to confusion and is an open invitation to garbling and misrouting. If you have a batch of traffic in which some part is the same in each, use the "book" message form. If you don't want to do this, then *send the whole message* each time. Don't say "same."

Even some so-called "good" traffic men do this. But the receiving station, after the traffic is copied, must figure out what the "sames" are the same as, and if they take different routings, as they usually do, he must recopy texts, addresses, preambles, or whatever parts of the messages are identical, before he can pass them on and properly file them. It makes for general messiness, is always unnecessary and invites errors. The only reason it is used is because the sending station is lazy or doesn't know how to put the traffic in "book" form, or both.

The principles of book messages were explained in this column in July, 1957, *QST*. They are very simple: indicate that a "book" is coming (and state how many are in the book), then transmit all the parts common to all the messages in the book; after that, transmit the parts that are different to each message. See July 1957 *QST* for complete details.

We have had arguments that the reason amateurs send "same" instead of using the book form is that this way they get more message credits. In this they are erroneous. They may *take* more message credits, but they are doing so against the rules. To count in your ARRL traffic total, messages must be handled in "standard ARRL form." Use of the word "same" is *not* standard ARRL form. Standard procedure is to use the book or send each message separately and completely. There may be some traffic men who handle traffic just to run up a big score, but we don't recommend this as a sole reason for being in traffic work, any more than we urge amateurs to get ORS appointments just so they can take part in CD Parties. If you count traffic containing the word "same" in your traffic total, you are taking false credits.

So, you ask, what can you do when someone sends you traffic and uses this forbidden word? Well, if you want to be *real* nasty you can tell him to stand by while you recopy the whole thing; and you have good and sufficient justification for doing this, because you want to make sure you don't get mixed up in passing the messages along or delivering them. In order to keep your friends, however, you may want to clip all "sames" together carefully and recopy them after the contact has been completed, at your leisure. Then, in passing them on, you can rearrange them into books as indicated. If you do this, we'll allow you to count them in your traffic total. But the sending station in this case would be claiming traffic points he did not earn if he counts each of the messages he used "same" in as a separate relay.

The gist of this tirade is as follows: let's eliminate the use of the word "same" in our traffic handling unless it actually appears in the body of the message. It is one of those time-savers that are efficiency-wasters. And if you catch someone

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for September traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W2KEB	238	1696	1392	258	3584
W3CUL	225	936	702	214	2077
W8SCA	36	788	775	4	1603
W9BDR	51	785	675	13	1524
K4SJH	147	647	549	11	1354
W7BA	15	599	573	24	1211
W8UPH	21	568	526	41	1156
K6HLR	63	534	463	48	1108
W1UEQ	335	328	271	53	987
K5FHU	41	440	431	45	957
W9IA	28	468	404	4	924
W9CXY	4	439	415	24	882
W9LGG	70	414	358	34	876
K6YBV	50	420	390	15	875
W9NZZ	200	309	0	309	818
W9PZO	14	392	376	10	792
W5RCF	27	380	363	17	787
W9DO	19	368	333	54	774
W7PGY	19	341	307	29	696
W9VAY	21	329	310	6	666
K6CPT	14	325	101	200	640
W6GYH	161	243	195	35	634
W4PFC	21	299	281	29	630
K9DNM	42	293	288	5	628
K4EZL	162	241	189	31	623
K2OOK	200	199	164	14	577
K2SIL	32	275	256	5	568
K4ELG	26	283	222	37	568
K1AQB	30	254	250	4	528
K4QIX	29	247	178	66	520
W9CPI	3	257	247	10	517
Late Report:					
W9IA (Aug.)	29	460	370	3	862

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
K5W8SP	210	403	321	80	1014
W6YDK	13	265	252	13	543
Late Report:					
K6MCA (Aug.)	29	889	877	16	1811

BPL for 100 or more *originations-plus-deliveries*

K6GZ	299	W4BZE	120	K1BCS	100
W2JGV	182	W9KJZ	120	K4KZP	102
K9GDQ	149	W8GFE	116	KØKYK	102
W4SHJ	140	W9PCQ	109	Late Reports:	
K5DUJ	138	KØIRL	106	K4DRO (Aug.)	123
K2PTS	131	W2ATC	104	W4PVE (Aug.)	123

More-Than-One-Operator Stations

K9CLU	443	WØDVL	181
		K3WBJ	107
W1AW	102		

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W1CMH, K2DVT, K4D8D, K5FJA, KØIDV.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

ring doing it (who either doesn't read *period*, or who doesn't read this far into the fine print), refer him to this column, this issue, or to the July, 1957, issue.

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Net Reports. Hudson Traffic Net held 27 sessions, had 155 QNIs and handled 102 messages. Transcontinental Phone Net reports: 1st Call Area, 1776; 2nd Call Area, 1741; 4th, 5th, 8th, 9th and 0th Call Areas, 476; total, 4043. Early Bird Transcontinental Net held 30 sessions, handled 777 messages. Interstate Single Sideband Net held 30 sessions, had 1283 check-ins, handled 612 messages in an average session time of 51 minutes.

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National Traffic System. We are still getting traffic, presumably sent over the system, which is entirely too old. In every case in which this has been investigated the fault is found to lie, as it inevitably must, not in the system as set up but in its improper implementation. Somewhere along the line, someone goofed. A liaison was not made, a TCC schedule was not kept, net operating times did not coincide to effect an efficient transfer. In every case the system, had it been properly implemented, would have resulted in the message having made good time.

This puts us back on an old theme: net operating times in NTS were designed to effect the most efficient transfer of traffic from one net to another. If concessions to members' operating conveniences are made to change these times (as they often must be), there will usually be a flaw somewhere along the flow pattern. True, it is better to have a net operating at the wrong time than not to have a net operating at all, if it comes to that, but often we suspect that an NTS net operating at a time other than that specified in the NTS plan does so from force of habit, has a tendency to collect operators who can operate at that time rather than at the *right* time, and that no thought is given to the possibility of changing the net to its proper operating time and finding operators who can operate at *that* time. This makes for an anomolous situation in which the regular flow of traffic from section to region to area to TCC to area to region to section cannot be followed. Result: delays, reroutings (often mis-routings), taking traffic off of NTS routes to be put on other routes which can (maybe) get it to its destination faster.

NTS is unique among traffic routes because its operation can be and is described in terms of functions, not individuals. The individual performs a certain function once, or maybe twice a week, but at other times the same function is performed by someone else. If we are to derive maximum benefits from such a setup, the convenience to the individual must be considered secondary to the function to be performed. This means that we must find the individual to perform the function, not to tailor the function to fit the individual's convenience. Where some flexibility is possible, the latter can sometimes be accommodated, at least to a limited extent. Mostly, we have to depend on finding traffic men who can fit into the schedule.

One of our greatest needs is for good c.w. traffic handlers. There are lots of excellent c.w. operators, contrary to popular belief that phone is gradually taking over ham radio traffic (as well as most other specialties). If you don't believe it, take a listen to some of the sharp operating in our "big three" contests — by amateurs that you and I never heard handle a message. Seems a terrific waste of talent to see all those good ops playing when they could be doing something useful. We should be able to entice *some* of them into NTS. You NTSers, if you have an opportunity, ought to work on them once in a while. One night a week would be enough. Appeal to their vanity and, if they have no sense of dedication, to their desire for individual glory (as a denizen of the BPL or holder of a net certificate or even a net manager's certificate). It might work on some of them. And some of *them* may decide that traffic handling is actually *fun*, and stay with it.

September Reports:

Net	Sessions	Traffic	Rate	Average	Representation(%)
EAN	23	1027	.882	44.6	97.1
CAN	30	807	.658	26.9	100.0
PAN	30	1064	.536	35.5	93.3
1RN	25	318	.311	12.7	85.7[1]
2RN	51	496	.342	9.7	97.6
3RN	44	383	.366	8.7	74.2
4RN	51	491	.263	9.6	62.2
RN5	52	437	.229	8.4	91.3
RN6	33	496	.330	15.0	83.3
8RN	44	156	.150	3.5	86.4
9RN	44	1197	.666	27.2	81.8
TEN	74	766	.285	10.4	62.7
ECN	22	64	.215	2.9	67.7[1]
TWN	22	186	.166	8.5	70.9[1]
Sections[2]	807	6403		7.1	
TCC East	75[3]	143			
TCC Central	60[3]	650			
TCC Pacific	107[3]	777			
Summary	1442	15,861	EAN	9.9	CAN
Record	1142	12,369	.692	15.4	100.0

[1] Regional net representation based on one session per night; others are based on two or more.

[2] Section nets reporting: AENT, AENP & AENB (Ala.); SCN (Calif.); QMN (Mich.); GSN & GAN (Ga.); CN & CPN (Conn.); HNN & CWXN (Colo.); MDD (Md.-Del.-D.C.); NJN (N. J.); SMN (Md.); TLCN (Iowa); Iowa 75 Phone; S. Dak. CW, S. Dak. 40 Phone & S. Dak. 75 Phone; WSN (Wash.); ILN (Ill.); SCN (S. C.); WVN (W. Va.); VN (Va.); KYN, KPN Morning & KPN (Ky.); FMTN, Gator & FN (Fla.); MSN, MSPN Noon & MSPN Evening (Minn.)

[3] TCC functions reported, not counted as net sessions.

No doubt most of our nets have at one time or anothe had stations reporting in who are willing to undertake any assignment simply by making themselves available to the NCS for whatever needs to be done. They may be used for

QNB purposes, to QNG if the NCS should have to rush off for any reason, to take a liaison to a higher echelon if the regular for that purpose doesn't show or is overloaded, or for any other of a number of uses. The Sixth Regional Net under its new manager, K6HLR, has adopted the practice of *assigning* a "utility" man to each session for just such purposes. It's a good assignment and it takes a good man to fill it, because he has to be ready for almost anything. He might find that the NCS doesn't show up (egad, does this happen?), in which case he's it. Or, if the regular station assigned to go to the area net doesn't show, there's another chore for him. On RN6 they have a rule that if net stations QNI with more than 15 for the area net, the utility station is called on to help out and take any excess to the area net. In addition, he is expected to monitor the area net, and if he finds that the traffic for RN6 is heavy he will QNI and help clear it, then take it back to RN6's late session.

Not a bad system, eh? Maybe all NTS nets ought to have, in addition to a NCS and a liaison station, a "utility" station on regular assignment to take up the slack when the going gets rough, as it often does especially on regional and area nets. Also, being assigned utility man will be sort of like being handed a surprise package — you won't know what's in it until you open it. These things keep life from being boring.

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K6DYX, having been elected SCM, also elects to relinquish his PAN managership (chicken!); PAN certificates have been issued to K6SXA, *W7s* OCX QLH ZB VIU and WØWMK. First Regional Net certificates have been issued to the following: *W1s* FJJ GPY IHN HKA MTX WVV ZPB/1, *K1s* BYL BGC; 1RN is now conducting a Sunday session on trial. W3UE says that the mailman is still making BPL on deliveries to Pennsylvania and Delaware. K6HLR starts his term as RN6 Manager with a fine bulletin to all regular participants, outlining policies and procedures in definitive terms; K6YBV is assistant manager.

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Transcontinental Corps. The following have received TCC certificates for their work in Eastern Area TCC: *W1s* AW EMG NJM TYQ, *W2s* HDW VDT ZRC, *W3s* COK LXU, K4KNP, W9DO. Our October chart of Eastern Area TCC showed ten vacancies (out of 28 possible assignments). Anyone interested, contact W3WG. There are no vacancies (except as alternates) in Central Area, and three vacancies (all on the week end) in the Pacific Area. Good c.w. men with traffic savvy are needed.

October reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	75	89.3	1382	143
Central	60	100.0	683	650
Pacific	104	94.2	1518	777
Summary	239	94.1	3583	1570

The TCC roster: Eastern Area (W3WG, Dir.) — *W1s* EMG AW NJM, *W2s* HDW VDT, K2SIL, *W3s* COK LXU WG, K4KNP, W9DO. Central Area (WØBDR, Dir.) — *WØs* LCX SCA BDR LGG, W9CXY. Pacific Area (W6BPT, Dir.) — W5DWB, *W6s* ADB PLG BPT EOT VZT UTV HC ELQ ZRJ YHM, *K6s* DYX ORT EWY HLR GES GID, *W7s* VIU GMC ZB, WØKQD.

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. The notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate for Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

Section	*Closing Date*	*SCM*	*Present Term Ends*
Yukon*	Dec. 10, 1958	W. R. Williamson	Mar. 17, 1949
West Indies	Dec. 10, 1958	William Werner	Aug. 10, 1958
Idaho	Dec. 10, 1958	Rev. Francis A. Peterson	Oct. 10, 1958
Vermont	Dec. 10, 1958	Mrs. Ann L. Chandler	Oct. 10, 1958
Colorado	Dec. 10, 1958	B. Eugene Spoonemore	Feb. 11, 1959
Minnesota	Dec. 10, 1958	Robert M. Nelson	Feb. 17, 1959
Michigan	Dec. 10, 1958	Thomas G. Mitchell	Feb. 17, 1959
Eastern Florida	Dec. 10, 1958	John F. Porter	Feb. 21, 1959
Sacramento Valley	Dec. 10, 1958	LeVaughn Shipley	Feb. 25, 1959
Missouri	Dec. 10, 1958	James W. Hoover	Mar. 1, 1959
British Columbia*	Jan. 9, 1959	Peter M. McIntyre	Mar. 13, 1959
Maryland-Delaware-District of Columbia	Jan. 9, 1959	Louis T. Croneberger	Mar. 21, 1959
Hawaii	Feb. 10, 1959	Samuel H. Lewbel	Apr. 10, 1959
Nebraska	Feb. 10, 1959	Charles E. McNeel	Apr. 15, 1959
Los Angeles	Feb. 10, 1959	Albert F. Hill, jr.	Apr. 18, 1959
Wisconsin	Mar. 10, 1959	George Woida	May 12, 1959
Connecticut	Mar. 10, 1959	Victor L. Crawford	May 23, 1959
Oregon	Mar. 10, 1959	Hubert R. McNally	May 28, 1959
Mississippi	Mar. 10, 1959	John Adrian Houston, sr.	May 29, 1959

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 160 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Northern New Jersey	Edward Hart, jr., W2ZVW	Oct. 10, 1958
Arkansas	Ulmon M. Goings, W5ZZY	Oct. 15, 1958
Santa Clara Valley	William C. Smith, K6DYX	Oct. 15, 1958
Rhode Island	Mrs. June R. Burkett, W1VXC	Oct. 15, 1958
New Hampshire	Robert H. Wright, W1RMH	Oct. 20, 1958
Western Massachusetts	John F. Lindholm, W1DGL	Nov. 10, 1958
Southern Texas	Roy K. Eggleston, W5QEM	Dec. 10, 1958

In the Kansas Section of the Midwest Division, Mr. Raymond E. Baker, WØFNS, and Mr. Roy T. Stromberg, WØMEF, were nominated. Mr. Baker received 208 votes and Mr. Stromberg received 195 votes. Mr. Baker's term of office began Oct. 29, 1958.

W1AW OPERATING NOTE

The complete W1AW operating schedule which became effective October 26 appeared on pp. 89–90 of last month's *QST*. See that issue for full details on when and where to look for the ARRL Headquarters Station.

Printed master schedules listing W1AW operation in EST, CST or PST are available on request. Also, a map showing how to get to W1AW from local highways will be sent to amateurs advising of their intention to visit the station.

A.R.R.L. ACTIVITIES CALENDAR

Dec. 3: CP Qualifying Run — W6OWP
Dec. 23: CP Qualifying Run — W1AW
Jan. 8: CP Qualifying Run — W6OWP
Jan. 10–11: V.H.F. Sweepstakes
Jan. 17–18: CD QSO Party (c.w.)
Jan. 21: CP Qualifying Run — W1AW
Jan. 24–25: CD QSO Party (phone)
Jan. 31–Feb. 15: Novice Roundup
Feb. 4: CP Qualifying Run — W6OWP
Feb. 6–8: DX Competition (phone)
Feb. 13: Frequency Measuring Test
Feb. 19: CP Qualifying Run — W1AW
Feb. 20–22: DX Competition (c.w.)
Mar. 5: CP Qualifying Run — W6OWP
Mar. 6–8: DX Competition (phone)
Mar. 19: CP Qualifying Run — W1AW
Mar. 20–22: DX Competition (c.w.)
June 27–28: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Nov. 22–23: 21/28 Mc. Telephony Contest, RSGB (p. 68, last month).

Dec. 6–7: West Virginia QSO Party, Kanawha Radio Club (p. 164, this issue).

Dec. 7: Wisconsin QSO Party, Milwaukee Radio Amateurs' Club (p. 136, this issue).

Dec. 12–14: Vermont QSO Party, Tri-County Amateur Radio Club (p. 154, this issue).

Dec. 13–14: Massachusetts QSO Party, Merrimack Valley Amateur Radio Club (p. 150, this issue).

Jan. 9–11: WAE DX Contest (c.w.), DARC (next month).

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on Dec. 23 at 2130 Eastern Standard Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted on Dec. 3 at 2100 PST on 3590 and 7128 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs for ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date Subject of Practice Text from October *QST*

Dec. 1: *Remote Control of a Grid-Dip Meter*, p. 15
Dec. 4: *A Versatile 50-Mc. Transmitter*, p. 16
Dec. 9: *Simple Low-Pass Filter Design*, p. 21
Dec. 12: *An All-Electronic Key and Keyer*, p. 28
Dec. 16: *How I Come to Be a Ham*, p. 49
Dec. 18: *June V.H.F. Party Summary*, p. 88
Dec. 22: *Official Results . . . DX Competition*, p. 50
Dec. 30: *Operation Alert, 1958*, p. 70

MEET THE SCMs

Samuel H. Lewbel, KH6AED, SCM of Hawaii, originally was licensed in 1931 as W2BKR.

He has participated in ARRL Sweepstakes and Field Days and was elected "Ham of the Year" at the 1957 Territorial Amateur Radio Convention held in Honolulu. A member and past-president of the Honolulu Amateur Radio Club he also is active in the Territorial C.D. Agency and as a Radio Officer in RACES. He wrote and successfully pushed through the Bill to permit the use of ham call letter plates in Hawaii.

Besides the big kw. final with an 833, KH6AED has a pair of 826s on 2 meters with an eight-element antenna, works mobile on 10 and drives the big rig with a Viking Ranger using a 20-A for s.s.b. A Boehme keyer and Wheatstone perforator are available for his code practice sessions and a Model 14 is used for RTTY. For emergency use a 1.5-kw. gas generator is on hand. Receivers are an HRO-60 and a BC-639.

CONTEST NOTES

Last chance to get your 25th ARRL Sweepstakes log in! It has to be postmarked by December 3 to insure eligibility for awards and listing in the *QST* official results.

— ··· —

Certificates for all winners in the 24th ARRL International DX Competition (final results in October *QST*) were mailed November 5.

— ··· —

Four boo-boos in the summary of the June V.H.F. QSO Party (p. 88, October) have been brought to our attention. The tabulations for San Diego and Santa Barbara Sections, omitted from Southwestern Division, should have appeared as follows:

San Diego

W6ZOP/6.....4050-405-10-AB
K6COE.....616- 88- 7-AB

Santa Barbara

W6PFE/6 (W6s GQB PFE KN6OOZ)
1904-238- 8-AB

The call of K2IXB, fifth in Western New York with 427 points, was erroneously shown as K2IXR.

To all concerned, we hasten to extend our apologies.

CLUB COUNCILS AND FEDERATIONS

Affiliated Council of Amateur Radio Clubs, Lyman Rinker, W7AZD, Secy., 3734 N.E. 66th Ave., Portland 13, Ore.

British Columbia Amateur Radio Association, George R. Kitson, VE7ALE, Secy., 389 E. St. James Rd., North Vancouver, B. C., Canada.

Indiana Radio Club Council, Inc., Fred Sawyer, W9FJI, Secy., 526 South Gibson St., Princeton, Ind.

Michigan Council of Clubs, Roland R. Beineman, W8QBA, Secy., 136 Guild St., N.E., Grand Rapids 5, Mich.

DX Century Club

The following list contains the call letters and countries totals of all holders of the Postwar DX Century Club award as of September 30, 1958. The calls of new members as well as those receiving endorsement credit during the period September 1 through September 30, 1958, are included in this listing.

• 256
W1FH
W6AM
ZL2GX

• 255
W5JUF
W9ELA

• 254
KV4AA

• 253
W8HGW
PY2CK

• 252
W1AXA
W6LW
W7FZA
W8DAW
W8EWS
DL7AA
HB9J
VE7ZM

• 251
W1HX
W2DS
W3KDP
W5EGK
G6RH
ON4AU

• 250
W2JT

• 266
W6TI

• 265
W8JBI
W9FID
G6ZO

• 264
W1JYH
W2QHH
W6NTR
W8KML
4X4DK

• 263
W6SAI
W8JBI
W9FID
G6ZO

• 262
W1BIH
W3JTC

• 261
W3EVW
W4DQH
W6SN
W6VE
VK2ACX

• 260
W1GKK
W1TW
W6VFR
W6YY
CE3AG
VK2DI

• 259
W6MEK
WØDAE

• 258
W2WZ

• 257
K2GFQ
W3IYE
W9ABA

• 256
W5BGP
WØAIW

• 255
W7PHO
W9FKC
WØNLY

• 254
W2HMJ
W9AMU

• 253
W1AXA
W6LW
W7FZA
W8DAW
W8EWS
DL7AA
HB9J
VE7ZM

• 252
W1HX
W2DS
W3KDP
W5EGK
G6RH
ON4AU

• 251
W2JT

W3ECR
W3EPV
W3LOE
W6CYV
W6GPB
W6LDD
W6UHA
W7ENW
W7GXA
W8SYC
W8WZ
W9FJB
WØDU
WØYXO
G3HLS
OE1ER
OK1MB

• 249
W5ABY
WØQVZ
PAØUN

• 248
W4LVV
W4LZF
W4QCW
W5MIS

• 247
W4EPA
SM5LL

• 246
W7AC

• 245
W1TYQ
W2KUW
W4HA
W8TMA
FA8IH

• 244
W1ADM
W2LV
W5KC
W6BVM
W8MPW
W8UDR
W9FDX

• 243
W8LKH

• 242
W1CWX
W3CGS
W3LMA
W8KPL
HB9EU
HB9X
KH6IJ

• 241
W2JVU
W3DRD
W4BPD
W4KFC
W4LYV
W4OM
W5FFW
W6TZD
W9GRV
VE7GI

• 240
W2CNT
W3OP
W4ML
W5OLG
W6BZE
W6CTL

K6ENX
W6HX
W7AH
W7KTN
W8UPN
WØNTA
G3DO

• 239
W2CTO
CE3DZ

• 237
W2CVS
W4MR
W5BZT
WØGKL

• 236
W2QKS
W6FOZ
W9YSX

• 235
W3CPV
W6OME

• 234
W2GT
W4AAU
W5ALA

• 233
W2BRV
K2BZT
W3JTK
W6DI
F8BS

• 232
W5CKY
W5GEL
W6KZL
W6VSS
W8CLR
W8QJR
W9QLH
WØAZT
G6YQ
OK1FF
SM5KP

• 231
W2DEC
W2PRN
W2SAW
W3ADZ
W3VKD
W5UX
W6EFR
W6NGA
W6PH
W6QNA
W6TXL
W7HXG
WØNUC
G4ZU

• 230
W1HA
W2TQC
W2TXB
W2ZGB
W4GXB
W5AFX
W5BNO
W5CEW
W7FB
W8EV
W8GLK
W9KOK
W9UXO
WØQDF

I1SM
LA7Y

• 229
W1BLF
W3OCU
W6ALQ
W6GRL
W6QJU
W6ZCY
W9IU
G3FKM
ZS6OW

• 228
W6YMD
W7ADS
W9WHM
VE2WW

• 227
W6KEV
W8DHC
G3YF
4X4RE

• 226
W5LXY
SM5ARP

• 225
W1KFV
W8SDR

• 224
W2RWE
W4CYY
W5MMK
W6KYG
W8CED
PY1GJ

• 223
W1MV
K2GMO
W3FGB
W5FXN
W6WO
W7NKW
W8PUD
WØANF
KV4BB

• 222
W1IAS
W2BOK
W2BYP
W2YW
W3DPA
W6CHV
W6PYH
W8YIN
CO2BL
DL7AH
GM3EST
LU7CD
ZS6FN

• 221
W1ZW
K4AIM
W4FIJ
W5EFC
W6ZEN
W8NGO
G3AAE
I1AMU
ON4NC

• 220
W1ENE
K2CPR
W2GVZ

W2N8Z
K2OEA
W3DKT
W3PGB
W3ENE
W5FNA
W5OGS
W6AMA
K6EVR
W6ID
W9QIY
I1AOF
KP4KD
ZL2HP

• 219
W1VG
W2BBS
W2LAX
W3GRF
W5NW
W6YK
PY1AJ

• 218
K2BU
W3MFW
W5PZL
HB9ET
KP4CC

• 217
W1FZ
W2CR
W2OKM
CM9AA
ON4FQ

• 216
W2AYJ
W3EYF
W6EHV
W6KSM
G3FNN
G8IG
ON4PA
TI2TG

• 215
W2YTH
W7AJS
W7ASG
DL7AP

• 214
W2HSZ
W4CFD
W5EB
W6CAE
PY1DH
VE8NX

• 213
W4DHZ
WØVBQ
OH2RY

• 212
W2HZY
W2UFT
W6MHB
W8BTI
EA3CY
G3BKF

• 211
W2BJ
W2HQL
W3ALB
W3WGH
K6CJQ
W6DBP
W6KBC

W6LN
W8VDJ
WØPNQ
EA2CA
G2MI
G6BS
OZ7BG
ZS2X

• 210
W1BIL
K2DLT
W1LZE
W1TX
W2AGO
W2DSB
W2EMW
W2NUT
W3MDE
W5DMR
W5HDS
W5JC
W5KBU
W5KUJ
W6GMF
W6JK
W6MJB
W6WWQ
W7HIA
W7HQC
W9EU
G5VT
KZ5CP
PY4IE
VE3QD

• 209
OK1HI
SM5WI
VE7HC

• 208
W1ZL
W4AIT
W7MGT
DL7BA

• 207
W1ICP
W2AEB
W2AQW
PY1AHL

• 206
W1AB
W3GHS
W4NNN
W9LNM
W9GIL
WØBCI
VE1EP

• 205
DL1BO

• 204
W2GFW
W2HHF
W5NMA
W6NJU
W9VIN
LA3DB

• 203
W2TE
W3LMM
W6SIA
W6TPJ
W6LDJ
W6NHA
W8ACE
W8CDT
WØPGI
G3FXB

IT1TAI
VK3YL

• 202
W2IWC
W3JKO
W4RBQ
W5TIZ
W7DL
W7QGF
W8CQ
W9KXK
W9SFR
CX1FY
HB9MQ
PY1HX
SM3AKM

• 201
W1FFO
W1RB
W2DKF
W2SUC
W2TWC
W3RNQ
W3VOS
W4BQY
W4BYU
K4CTU
W5DGV
K6AYA
K6ENL
W6GMC
W6LRU
W6PQT
K6UYC
W7EJD
W9FNR
W7HKT
W9GDI
W9JUV
WØQGI
WØUQX
CN8JX
CT3AN
DL1QT
G6XL
KH6BA
LA5YE
PY4AO
SM7QY
ZL1AH

• 200
W1BLO
W1WK
W2ALO
W2AZS
W2FBS
W2IRV
W2MUM
W2REF
W2SSC
W2TQR
W3FYS
W3NCF
W3WU
W4AZK
W4BRB
W4IMI
W4THZ
W5DML
W5LGS
W6ATO
W6BIL
W6BUD
W6EPZ
W6GAL
W6KEK
W6MVQ
W6PB
W6RBQ
W6RLP

W6SQP
W6UQQ
W7FAW
W7RT
W8DUS
W8DX
W8TJM
W9ABB
W9BQE
W9MQK
W9UIG
WØSYK
CR6BX
DL3RK
G5RV
G6QB
G8KS
I1AIV
I1XK
I1ZFD
KH6PM
ON4QF
PAØGN
SM5CO
VE1PQ
VE3AAZ
VE3DIF
VE6VK
YV5AE
ZL1BY
ZS1BK

• 199
W1BFT
W1LOP
W2IYO
W2LSX
W3NKM
W6EAY
W6ULS
W6ANN
W8IRN
W9DXE
VK2NS

• 198
W1EOB
W3ALX
W6BYB
G8KP

• 197
W1CH
W2JB
PY4ZS

• 196
W9TQL
SM3BIZ

• 195
W2ZVS
W3AXT
W4TFB
W5HJA
W6MEL
DL1KB
SM5KX
VE8AW

• 194
W1KXU
W1LHZ
W7PGS
HB9KB
KH6LG

• 193
W5LGG
W9RKP
EA4CR
F3FA
VE7YR
ZS2AT

• 192
W1DEP
W1OJR
W1ZZK
W4PN
K4PTL
K6EC
W8HFE
W9YNB
DL6YK
OZ3Y

• 191
W1AEW
W3AYS
W4FVR
K6EWL
W7GHB
W8HMI
W9KA
WØUQV
CN8MI
EI9Y
F8PQ
G3EMD
I1KN
KL7PI
OQ5RA
VE3AIU
VO1DX

• 190
W1BGA
W1JNV
W1MB
W1NLM
W1QNC
W2CWK
W2EQS
W2GUM
W2IOP
W2QJM
W3HIX
W3SOH
W6BUO
W6CG
W6LTX
W6OMC
W6UCX
W7AUS
W7BGH
W7IQI
W8AJW
W8CVU
K9BVR
W9DYG
W9JIP
CR6AI
ET2AB
JA6AO
KH6CD
OK1CX
OZ3FL
VO6EP
ZL4GA

• 189
W4GRP
W4VYP
W6SUQ
W8OGV
JA1AA
PAØNU
VS6AE

• 188
W2CWE
W9IOD
WØBFB
WØIEV
FA8DA
OZ7PH
VQ2DT

• 187
W3ZAO
W5CFG
W9AND
F9RM
G3DOG
KR6AC
VE7JB

• 186
K4BVQ
W5AWT
W9WFS
OH3RA

• 185
W1RY
W1WY
W8LAV
W8BPA
CP5EK
CT1JS
F8CW
OE3WB
ON4DM
YU1AG

• 184
W1FTX
W7FBD
W7GUI
W9MXX
JA1AG
SM5WJ

• 183
W2UVE
W3IMV
K4LPW
W5GNG
DL9PX
I1OJ
KZ5WZ
VE2NV

• 182
W1BGW
W2DOD
W2IWM
W3SWV
W3WDC
W4NBV
W4NNH
W5MET
W6SRU
JH9CX
JH6AYG

• 181
W1TS
W2MLO
W3KQF
W3RUT
W4UXI
W6SWG
W6VDG
W6LI
DL1DX
DL3FM
DL6MK
GM3CSM
LA6U
PY1ADA
PY7VG
SM5ARL
TG9AD
9H1AX

• 180
W1DQH
W1JMI
W1ODW
W2ABM
W2IMU
K2JYH
W3AS
W3LEZ
W3LPF
W3MLW
W4HVQ
W4HYW
W4JBQ
W5VIR
W6EAE
W6EYR
W6PLK
W6RM
W6ZVQ
W7DAA
W8DLZ
W9RQM
W9EYR
W9TKX
CX1BZ
DL1GU
F8EJ
G2EC
OK1JTI
ON4JW
PA0VB
VE3JZ
VE7VC
VE7VO
YV5BZ

• 179
W2CSO
W2GWE
W3KZQ
W4GJW
W6PZ
W9YCR
ZL4BO

• 178
W1AUR
W2COK
W6NIF/4
W8LHP
G2WW
VK3BZ

• 177
W2RDK
W4CYU
K4LNM
W8BOJ
CT1FY
JA1CR
KG4AF

• 176
W2AYU
W3QJV
W4ECI
W4JDR
K5ABW
W6BJU
W6CYI
W8MWL
W8VLK
W9AEH
CE3HL
PA0HP
VK5RX

• 175
W1ZDP
K2PIC
W3NA
W3NOH
W6BAM
W9WYB
DJ2AE
G3AIM
KH6QH
LU5AQ
VQ4KRL

• 174
W1ATE
W1BOD
W1DSF
W1NI
W2FXE
W5RIO
W8RDZ
W9TJ
DJ2BW
EI4X
F8LF
KH6VP
MF2AA
ON4FL

• 173
W1WLW
W2DEW
W2MZB
W4LQN
W6FUF
W8PWH
W9TKU
G3COJ
I1ALU
I1IT
JA6AD
VE3PK
W1CW
W3JNM
W4TP
W8WFB
W0AIH
DL4ZC
G3ABG
G3DCU
HB9QU
PY7LJ
VE3IJ
VK4FJ

• 171
W1HRI
W1PKW
W1RAN
W2ESO
W2LJR
W2PWP
W2RGV
W4AAW
W4DKA
W5TPC
W6DUB
W8FJN
W8UMR
W9ROU
W9UZS
W0CPM
GI4RY
OH2QQ
SM3AKW
VE7SB

• 170
W1CUX
W2BUI
K2LWR
W2NOY
W2QKJ
W3AFU
W3DBX
W3EBG
W3GEN
W3LVF
W3MDO
W3MJF
K4EJO
W4JII
W4SRT
W4VE
W6CIS
W6KUT
K6LGF
W6MUF
W6TKX
W6UOV
W7WVE
W8AE
W8DEN
K9AGB
W9ALI
W9FVU
W9VP
W0FNN
W0RBA
DL1YA
EA1BC
G6RC
HP1BR
IS1AHK
KZ5DG
PA0ZL
PY2NX
PY7WS
VE7MD
ZS6A
ZS6OV

• 169
K2ERC
W2FJH
W2PUD
W4AUL
W9NN
W0GUV
DL1EE
DL7CW
LA5Q
VP7NM

• 168
W2OBX
W2ROM
W2UWD
W3JYS
W6IPH
I1AY

• 167
HB9FU
OZ8SS

• 166
W1IJB
W1NHJ
W5CE
W5QVZ
W6PCS
W7DJY
W0DMA
G4TM
ON4KT
VS6CG

• 165
W3LBG
W5ACL
W9ERU
G2BXP
G6VQ
GM3CIX

• 164
W1DX
W2AOX
W2HO
W3ZQ
W8OCA
W9BBU
G5LP
ON4AZ
VE1HG
ZS1RM

• 163
W1ORP
W2BXY
W2GDX
W3JZY
W3RPG
K5ADQ
W7CSW
W0ERI
W0VBK
HB9MU
ON4GU
VE5RU
ZL1AJU
ZS1OU
ZS6KK

• 162
W2GTL
W2OST
K6EDE
W6ETJ
DL1LH
EI5F
G2AJ
HB9AO
JA1CJ
KL7PIV
PA0RLF
VK6SA
ZL3CC
ZS2AG
4X4BX

• 161
W1IKE
W1JEL
K2BSM
W2PZI
W2RA
W3AFW
W4CKB
W6GHU
W6WKU
W8EKK
W8EYE
W8TUO
W9WIO
EA1AB
EA2CB
G2IO
G2YS
GM3AVA
HB9DO
HB9KU
IS1FIC
KV4AQ
OK1LM
OQ5LL
PA0LOU
PA0RC
SM3EP
SM5CCE
YV5AK
ZL3GU

• 160
W1JDE
W1LQ
W1PFA
W1QMM
W2ADP
W2CKY
W2ICO
W2OGE
W2OTC
W3ARK
W3KFQ
W4GHP
W4NWW
W4UKA
W4WM
W4ZD
W5MCO
W6KJR
W6LVN
W6OUN
W6QDE
W6YMH
W7DET
W8NJC
W8WT
W8YHO
W9HQF
W9NZZ
W9QNO
W0MLY
F9IL
G2AJB
G2FSR
G3CBN
G6GH
GM6MD
I1CJW
KH6WW
KP4YT
OE1FF
OH2TM
ON4GC
OZ7SN
PY4AJD
SM5BCE
SM6HU
VK3XO

• 159
W3HER
W3KDF
W4AIS
W4JFE
W6VOE
W0DGH
GW3ZV
I1IR
KT1EXO
OK1VW
SM3ARE
VQ2GW

• 158
W7QON
W0GDH
PY5UG

• 157
W1QPN
W1NS
K2AAA
W2ITD
W4JXM
W6NIG
W8VTF
W9PGW
W0TJ
G3IDC
OH3NY
PA0FX
PY4RJ

• 156
W2SAI
K4PDV
W6BSY
W6NZ
W8PHZ
W0LLN
I1CZE
ON4TX
ZS6EU

• 155
W6ITH
K6IYJ
W8MFB
W0CDP
DL9TJ
G2AJF
G6GN

• 154
W1ZD
W2QCP
W3EOB
W3KJJ
W3KVB
W4AIX
W4JAT
W8ZJM
EA2CR
G3BNC
G3CSL
KP4JE
OY7ML
VP9G

• 153
W1GDY
W1QF
W2GTP
W3RSR
W6WTH
W7KVU
W8AJH
W8WWU
W9WKU
W0LBB
W0NGF
W0QBA
CE3AE
CR7AF
DL1ZN
DL7FW
HB9NT
OH2NB
OZ5PA
VE3ZW
VE6KX

• 152
W1APA
W1AW
W1MUN
W2GSN
W2MYY
W3WSF
W6FHR
W6JZP
W6LMZ
W9EHW
DL3BK
DL7EN
EA5BD
G4FN
G8UG
KP4WN
LA2B
ON4MS
SM6ID
SM7MS
SM7TQ
VE3ADV
VK5QR

• 151
W1KQF
W2BBV
W3FLH
W4COC
W5CGC
W5VGR
W8HUD
W8ONA
K9EAB
W9OTS
W9UX
DL3DP
DU7SV
G2BVN
GW3FSP
HB9NU
KP4WD
OH2LA
ON4TA
PY2AJ
SM5DZ
VE2BV
VK3JE
YV5FK
ZL3BJ

• 150
W1JOJ
W1AWI
W2AXR
W2BUY
W2CGJ
W2FXA
W2GUR
W2GVP
W2PJM
W3AZG
W3CPB
W3EEB
W3FMC
W3GRS
W3IXN
W3LVJ
W3MZE
W3RBW
W4FID
W4FYI
K4GEZ
W4HKJ
W4PVD
W4TAJ
W4YK
K5BGT
W5CEC
W5DA
W5UUK
W6CGQ
W6DE
W6EAK
W6GSL
W6MJP
W6PBI
W6RAN
W6VX
W7KWO
W7WH
W8FPR
W8JSU
W8KZT
W8PCS
W8PXP
W9CIA
W0AGO
W0DST
CR7BC
EA4BH
G2VD
G3AKU
G3ESY
G6VC
G8KU
G8PL
HK3CK
I1BDV
I1FO
KH6MI
OH1ST
ON4HB
OZ7EU
SM5CXF
SM5KV
SM6VY
VE3IR
VK4EL
ZC4XP
ZL3GQ

• 149
W2UEI
K4HXF
W4OPM
W6OBH
W8ILG
W8JXY
PA0IF
ZL2QM
487NX

• 148
W1EIO
W3BYI
W6CLS
W8BWC
W9BYN
FA9RW
G8RC
HB9CE

• 147
W1AH
W8DFQ
VE3HB

• 146
W3RCQ
W5LV
W5MY
W6LV
W7VMP
W8CKX
W9PVA
W9TGY
G6RB
PY2BAU
VE5JV

• 145
W2BMK
W2PXR
W6KG
W7AQB
CN8GU
CR5SP
F9DW
G3BI
G3GFG
JA2KG
PA0NOL
PA0TAU

• 144
W1FTJ
W1OTX
W2SHC
W4VCB/3
W6AGO
DL1BS
EA9AP
EI2T
G4QD
PY1ANR
3V8AB

• 143
W1JS8
W3HEC
W4EEO
W4EO
W6ZMX
W7BE
W9PQA
W9PSR
W9WHY
W0DSP
W0YPQ
DL1FI
DL3SZ
EA3CF
F3MS
G3GIQ
G3HCL
HB9IM
LU3DH
NY4CM
VE1NH

• 142
W1NW
W1OOS
W3ZAL
W4HQN
W5LVD
W8IB
W8LY
W9AHP
W9WJH
W9ZRG
W0IDI
EI4Q
G4JZ
G8GB
KZ5IP
VE1EK
VP5FR
VR2BZ
ZS5CU

• 141
W1AZY
W1EFQ
W2GNQ
W2KMZ
W3MQC
W4QT
W5KTD
W6APH
W7AYJ
W7SFA
W8ESR
W8ZCK
K9CLO
W0CU
EA7CP
G2FYT
G3LP
G3VA
G5LH
GM5RH
HB9MX
HB9UL
I1IZ
I1UA
PA0FAB
SM5AQW
SM7AKG
TA3GVU
VE2WA

• 140
W1CKU
W1FVF
W1JMT
W1MIJ
W1QXQ
W1RWS
W1VAN
K2CF
W2JVZ
W2OCI
W2OMS
W2PDB
W2VYX
W2ZA
W2ZY
W3DYU
W3EQK
W3ILA
W3WPG
W4CYR
W4IEH
W4IWO
W4IZR
K4JOU
K4JVE
W4YGZ
K5DGI
W5IGJ
W5PM
W5TTB
W5VNL
W6CTO
W6DQH
W6FZL
W7ACD
W7HJC
W7NRB
W8CXN
W8FJL
W9PNE
W0AJU
W0BSK
W0GKS
W0OAQ
W0OJW
W0OUH
DL1HA
DL3TJ
F8VR
F9AH
FQ8AP
G2AKQ
G5YV
G8ON
I1BLF
I1VS
KP4ADX
PA0LR
PA0VO
VE1EX
VE2YA
VE5QZ
ZL1QW
ZL4CK
ZS2CR
ZS3K
4X4CJ

• 139
W2EGG
W3FUF
W4PHJ
K6CU
W8ZZU
W9MZP
DL1YQ
EA3KB
F3AT
F8PM
G3AJP
G3AWP
G5FA
G6QX
LA8S
OZ7CC
PY7AN
SP7HX

• 138
K5ALA
W6FSJ
CX1CX
G5CG
HB9NL
OH2OJ
OZ5KQ
ZL3AB
ZL3LR

• 137
W1JTD
W6OF
W8AYS
W8SDD
GM3BCL
PY3QX
VE2YU

• 136
W4IUO
W4JZQ
W5RX
W9ZPT
CR9AH
G3AH
G3RB
KH6PY
VE7AIH

• 135
W1AF
W1BAV
W1ELR
W3LXE
W4DCW
W6ZY
W0CKC
F8SK
G3FKH
G5OO
G6XA
OH3RS
PA0DA
SM5BRO
SM5PA

• 134
W1APU
W1YPK
W3AOH
W3HUS
W3LNE
W3KBC
W4CYC
W5CPI
W5DXW
W6FLT
W9PIO
K0DMY
G5JU
G8VQ
GI3IVJ
OH1TQ
OH6RC
OZ7KV
PA0GT
SM6ACO
VU2JP
ZE2JN
ZS5YF
ZS6JZ
ZS6LW

• 133
W1CJK
W1KWD
W1LQQ
K2EDL
W2AW
K2GNC
W2MEL
W4BFR
W5LCI
K6QXF
W7PEY
W8ERA
W8LQA
W9CYT
W9CYU
W9MPX
W9TGT
W9ZTD
W0EWH
W0JFI
CX4CZ
F8WK
G5SR

GM3CMB
KL7MF
MP4BBE
OD5LX
PA0HJK
PY7VBG

• 132
W1YNP
W2PBG
W2TJF
W3KHU
W4BWP
W5BLA
W5ZZR
W6CEM
W6QPM
W6RRG
W7BA
W7PZ
W8JRG
W8KAK
G6UI
GM2DBX
HA4SA
HB9KC
KP4MV
LA7Z
OH2VZ
PA0NIC
SM5AQV
VK5KO
VK5LC
YU3AC

• 131
W1DEO
W1RYJ
W1ZDZ
W2AFO
W2CDP
W2DSU
W2GND
K2JGG
W3BQA
W3RBE
W4DXI
W4EFX
W4EJN
W4EV
W4IKM
W5DNF
W6AFI
K6DNH
W6JU
W6MHH
W6RLQ
W7GPP
W8AAI
W8MQR
W8OKB
K9CAN
W9UNG
WØMCX
ET3S
F3CT
SM5VW
SM7VX
VE1PA
VE5KG
VP7NG
ZE3JO
ZS2U

• 130
W1BRX
W1CTW
W1DHO
W1OOA
W2ABS
W2ATE
W2BBK
W2CZO
K2DGT
W2FLD
W2LTP
W2NIY
W2PCJ
W2PZM
W2RDD
W2STJ
W3BCY
W3HOX
W3HXA
W3LUD
W3VRJ
K4AL
W4AVY
K4BZL
K4DRO
K4HRG
W4IYT
W4JUJ
W4OSU
W5CDP
W5OEN
K6GXG
W6LER
W6OBD
W6OXS
W6RZS
W6WJX
W7RFE
W8HEV
W8YCP
W9ESQ
W9EXY
W9OAN
W9ROK
WØJMB
WØUYC
WØVIP
DL4RI
DL6GL
CN8DJ
EA9AI
F3RA
F9QU
G2BQC
G2FXB
G3GNM
G3IFB
G8FW
HB9CA
I1LT
I1UB
I1ZQ
JA8AA
KH6ER
KZ5KA
OH2PK
OH4NF
SM5OW
ST2AR
VE3BHS
VE3DKY
VE3NR
VE3TB
VP7NS
VK3YD
VQ2DH
VQ8AD
ZS6CZ

• 129
W1ODU
W1OJM
W2RQH
W3RZL
W4BGO
K4GIB
W8RVU
W8ZMC
W9WBL
CO8DL
DL1KV
DL3XS
DL4EA
I1CHJ
OK1SV
OZ5Z
PA0SPR
VQ8SGC
ZL1MR
ZS6AJQ

• 128
W2VRE
W4DRK
W5AUJ
W5BQJ
W7BTH
W8LOF
W9HKL
W9IRH
W9PZT
W9QYW
DL9SN
G3HJJ
G6BB
G8VB
PA0JQ
PY2DV
VK4RF

• 127
W1RZD
W1TSL
W3CTJ
W3MFJ
W5RHW
W6MI
W6YX
W9FKH
CR6AU
EA6AF
G5PP
I1BNU
KV4BK
ZL2AHA
ZS1FD

• 126
W1AZW
W1BDS
W3MWC
W3WJD
W5GZ
W6CBE
W6RDR
W7AHX
WØDJE/9
WØMKF
WØPDN
DL3TG
EA3CK
EI3R
FF8AG
HB9DB
HB9HZ
VE3EU
VP6CDI
ZC1CL
ZE3JP

• 125
W1AWE
W1MTG
W2BLS
W2LPE
W4SIB
W4YHF
W6BAG
WØIUB
CN2AO
DJ2KU
G2FRL
HA5KBA
I1BEY
JA3BB
OK1WX
PY1HQ
VE5GF
VK3PG

• 124
K2JFV
W3KQU
W3RBF
W4FNS
W6CEO
W6IDY
W6KYT
W8RSW
CE7AA
DL1JW
DJ3KR
G3GQS
G3GSZ
G5VU
OK1SK
OK2AG
PA0EXE
SM5AHK
SM5WZ
SM5XP
ZS6BJ

• 123
W1GKJ
W1KKP
W1YRO
W2NIN
K2PKT
W4ITR
W5JBD
W6UZX
W6YC
W8YPT
W9GWK
KØDQI
DL3JV
DL9GH
G3DQO
LA5HE
OH1TI
PAØMZ
PY6DU
SM6AKC
VE3KP
W1LRK/VO1
ZL4JA
ZS6GI
4X4DF

• 122
W1DIT
W1JLN
W1QV
W1YZG
W2CC
W2FBA
W3QMG
W6IFW
W6WLY
W7JYZ
W9DSO
W9POB
DJ1UR
DL4TL
DL6FT
DL7CX
F3CB
G5IV
HZ1HZ
I1RC
LU9CK
YV5ABD

• 121
W1HPI
W1UWB
W1WTF
W1YQC
W2AFU
K2LGN
W2QCF
W3DGM
W3EIS
W3YDF
W4BEY
W4FFV
W4GF
W4IFN
W4IKL
W4KKG
W4PBH
W5GAI
W5PYU
K6CEF
W6KYV
W6ZBY
W7KWC
W8NOH
W9BRD
W9GGO
W9ONB
W9JSN
WØMAF
CN8EJ
DL1DA
F8GB
F9DN
G2HIO
G3BXN
G3JKF
HI8BE
HK3PC
I1DCO
KG6AI
OE6RP
OH1SS
OK1GL
ON4KR
OQ5HP
PAØCP
PJ2AV
PY2AJK
SM5FA
UB5DW
YU3EU
ZD6RM
ZS1FR
4X4BR

• 120
W1ACB
W1BDI
W1BTE
W1CSC
W1DBM
W3EVT/1
W1GET
W1HWH
W1MRP
W1PPN
W1RLV
W2AQN
W2AWH
K2EDH
K2EQD
W2OXR
W2WPJ
W3AOO
W3CDG
W3DDV
W3MNO
W3QLW
W4DPE
W4EJH
W4GQE
K4HFS
K4IEX
W4OMW
W4TFX
K5BGB
W5URU
W5WI
W6YZU
W6GEB
K6OWQ
W7YOA
W8SWG
W8TTN
K9CUY
WØDGA
WØLSV
W9MUJ
W9YFD
WØBBS
WØDIB
WØQAZ
W6WLY/9
WØZYB
CE4AD
CN8AF
CO3YP
DJ3JZ
DL3TP
EA8BC
F3TP
G2HNO
G3BQ
G3CCN
G3IOR
G3TK
G5PQ
G6XX
GM3EOJ
HB9FE
I1NT
I1RMO
KL7IT
KP4TF
LA4KD
LA7X
LU3EB
OH1PZ
OH1QE
OK1AEH
OK1AW
OK1JX
OK1RW
ON4FP
PAØCB
SM5ARR
SM5KG
SM5VN
SM6DA
SM7ANB
SVØWT
VE3AGC
VE3ES
VK3NC
YU3BC
ZD2DCP
ZL1MB
ZS4AK

• 119
W2AWF
K2MIO
K4GSS
W4OG
W5KLB
W5QN
K6CWS
W9OVF
WØYZO
DL7AB
G4QK
G8DR
HB9P
HB9RM
KG6ABI
KG6DI
OH2PC
SV1RX
VE7KC
4X4DE

• 118
W9GFF
W9VAG
WØNWX
DL3GZ
EA5AF
FK8AO
G3COL
KZ5BB
VE4XO
ZS1KK

• 117
W2GZZ
W2PQJ
W3JNQ
W3MOT
W4GOG
W4TK
W6LS
W6SR
W7ITN
W7UDG
W9NRB
DL3OC
DL3WV
F3DM
F9DZ
G3JAF
G5UF
KP4AIO
OZ7SM
SM5WC
SM7AVA
VE7ZZ
VQ5EK
ZS2EC
ZS6WS
4X4FQ

• 116
W1LQO
W2AGU
W2AUH
W3TIF
W3TVB
W4LCY
W4WOG
W4YZC
W5UCQ
W5WZQ
W6DIX
W6HJ
W7BD
W7LVI
W8ZWX
K9ATZ
W9HTY
W9QWW
W9UKG
DL4EAC
DL7EM
F8OQ
G2BFK
GI3DQE
KL7BHE
OZ2PA
OZ9DX
SM5BAF

• 115
W1QQV
W2BWC
W2LWI
W2NCI
W2NFR
W3POE
W4KL
W6NKR
W7MWR
W7TML
W7YGN
W8JFC
W9CMC
W9CQG
W9KMN
W9LNH
W9YRO
G3LET
LU6AX
OH1PN
VE2CK
VQ2RG
ZL1OA
ZS2IW
ZS4MG

• 114
W1BBN
W1IUU
K2DSV
K2HVN
W4NKQ
W6MPY
W6NXP
W8WVU
K9ALP
W9ELA
W9LVR
W9CDV
WØDEI
WØLWG
WØMVO
CT1DJ
DL1FE
DL7BK
I1LD
I1WP
KH6RR
LA4DD
OH1PW
PY6BN
SP5KAB
VE2BR
VK4RC
VU2RA
ZE5JE
ZS6HO

• 113
W1PEG
W1YXD
K2OLS
W2TUD
W3HDZ
W6CHL
W6WPI
W9QLD
WØRZU
CN8EG
DL7CS
F8TM
G8OJ
ON4SS
OX3MG
SM3AGD
SM5ANY
SP8CK
TF3EA
VE1DB
VE2BK
VE3ACS
VQ3HJP
ZB1BF
ZE3JJ
ZS5BS
ZS5LA
ZS6J

• 112
W1AJO
W1MX
W2CJM
K2QQQ
W3BEN
W3PBD
W6AUT
W6CEI
K6GLC
W6JTB
W6KIG
W6OKD
W6TCQ
W7LVR
W8YGR
CT1NT
DL1CS
DL1IA
DL1HH
DL1MF
DJ2LM
EA5FC
EI9F
F9KQ
G2CDI
G2CNW
G3IMV
G3JHI
GI6TK
GM3CFS
HB9IL
I1BVP
JA6FB
OH1RT
OK1KTW
PY2WB
8L5AX
SM5LN
TG9AZ
UR2AK
VE3XY
VK5FM
ZE6JY
ZS6WJ
4X4CR

• 111
W1AWX
W1CDX
W1LVQ
W2IVS
W2KTU
W2MA
W2PTD
W2UAT
W3HHK
W3HUV
W3MQY
W3MSR
W3WUH
W3ZN
W4BBR
K4GOZ
W4HZZ
W4LIM
K4LTA
W4YHD
W5CRK
W6GBG
W7BDW
W7PSO
W8GFH
W8HRC
W8PNT
W8UUS
W8TTO
W9DUR
K9COS
W9DFV
W9HUV
W9TMU
WØBMM
WØCAW
W9GTU
KØGXR
WØQPL
WØSBE
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DL4UZ
DL7AQ
EA3KI
F3SM
G2FFO
G2IM
G3CEG
G3FPK
G4AR
G4AU
HB9MC
HP1LA
I1BAF
I1PG
JA3BP
LA1K
OH2KQ
OH2VF
OH4NT
PAØKE
PAØRL
PY2AK
SM2OS
SM5RC
SM7AOO
VE2APH
VE3EHR
VQ2AB
VS1HU
VS6CO
YV5GY
ZS5AM

• 110
W1EKO
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W1WKW
W1KQY
W1YYM
W1YYR
W2GVU
W2HAZ
W2MOF
K2QXG
K2SHZ
W2WDP
W3CLP
W3GJY
W3IPO
W3NQC
W3TBP
W3VXE
W3VZD
W4BIJ
W4EXO
K4IGS
W4JCH
W4KWC
W4WGB
W4ZKM
W5FDL
W5GSE
W5JPC
W5KWY
W5RDL
W5VSS
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W6AOD
W6AX
K6BFC
W6DBT
W6MUB
W6NUQ
K6OXU
K6SED
W6SEO
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W8CJ
W8FGX
W8GB
W8PCQ
W8SCU
W8TTS
W9FGX
W9HLR
W9INN
W9IOP
W9MXP
W9PCF
W9QGR
W9RHA
W9SWR
W9TJG
W9WNB
W9YKJ
WØCXC
WØGBJ
WØLLU
WØRIA
WØSRX
CO2WD
CR7AD
CR7LU
DL1AO
DJ1DF
DL1VU
DL6HJ
DL6XW
DL8CM
F3GL
F9MS
G2DPY
G2HKU
G3APN
G3CCO
G3CDG
G3CMB/A
G3CUG
G3DNZ
G3GNR
G3HXZ
G3KAA
G5CW
G5MN
G8IL
G8US
HA5BI
HB9AT
HB9FI
HB9GJ
I1ADW
OH2NQ
OH2UD
ON4JD
PAØAGR
PAØUW
PJ2AN
UC2AA
VE5TK
YV5FL
Z81M
ZS6SG
4X4FV

• 109
W1RCQ
W1ZFV
W2RUJ
K4KOR
W4VB
W4ZMC
W7GJ
W7MCT
W7OCL
WØRSZ
WØMCF/C1
CO6AJ
DL6IC
EI5C
EA3FL
ET2US
F3DA
F8SW
F9ER
FA3JY
FA5CF
FA9VE
G2DC
G2DHR
G3AMM
G3GGS
G8GP
G8IH
HB9BN
HB9EI
HB9KO
HZ1AB
KH6BLX
LU8EN
PAØPN
PY1FT
PY1RW
VE4DB
VE7AHG
VS1DZ
YV5BS
ZL2CU
ZS1EB
4S7GE

• 108
W1EZ
W2BOT
W2DKS
W4GCW
W4LHT
W4RNP
W5GAH
W5TJ
K6GJS
W6LGD
W6PUZ
W6YET
W7MQY
W8IZQ
W8MKY
W8PYX
W8WHQ
W9BGS
W9TLT
WØMJM
WØRKL
WØZKE
CR6CZ
DL1LD
DL1MN
DJ2YL
F7SHP
F9FY
F9IF
FA9OW
FF8AJ
G3AGN
G2BOZ
G3FJU
G3ISV
G4LX
G5GK
G6KS
I1CLW
KZ5KS
LA7XE
LU7AS
LZ1KPZ
OE5PP
OH1NK

OH5PE
OK2DD
PA0OK
SM5KB
SP3DG
SU1XZ
VE6GD
VQ4EI
XZ2TH
YU1AA
ZD6BX
ZD9AA
ZL1LZ

• 107
W1DDO
W1KLY
W1PDF
W2HIQ
W2JBL
K2RNN
W3BTQ
W3DJZ
W3EFZ
W3KVQ
W3YPI
W4BTU
W5BJA
W5OVE
W6CUL
W6ERB
W6NDP
W6PWR
W7HNY
W8BNA
W8DDK
W8IBX
W9CKP
W9GNU
W0YTL
CT1CB
DL1FK
DL1SO
DL3UE
F9RO
F8T8RT
G3CSP
G2KU
G8IP
G8QZ
HB9IH
HB9PM
IA1DO
IA3AA
KH6YL
OH2RW
OH3RY
OH5NJ
OH4PZ
PI2AA
SM7YO
SM6RS
ST2NG
VE1ZZ
VK7CH
YI2AM
YV5HL
ZD6RD
ZE3JJ
ZL3OA
4X4CW

• 106
W1EXY
W1QM
W2BHU
W2DPS
W3DYL
W3HTF
W3HTO
W4CS
W4FPK
W4KE
W5LAK
K5LIA
W5NNY
W5NUT
K6EYT
W6PQJ
W6WJM
W6YBR
W7FLD
W7TQO
W9LQF
W0BAU
W0GAX
DL1AV
DL1ME
DL1SC

DL1TM
DL1TS
DL1UE
DJ2HI
DJ2LK
DJ3BB
DL3IE
DL4PB
F3IM
F8BQ
F9EP
F9FS
F9JZ
F9RS
G2CBA
G2HFO
G2ZF
G3BHW
G3BYM
G3CMT
G3DDK
G3DMG
G3ETU
G3GWO
G3HIW
G3QD
G8TD
GI3JIM
HB9BJ
HB9PV
HB9CS
I1AEG
I1AMO
I1RY
JA2DN
KA2AL
KH6DQ
JA5AI
KG4AP
OA4ED
OH2HK
OH3OE
OH5OE
OH7OL
OK1CG
OK1JQ
OK3SP
ON4HX
OZ3RO
SM2BCS
SM5AJR
SM5DX
SM5TQ
SM5UH
SM6DN
SM7AUO
VE3AHV
VK3CN
VK5BO
VO1B
VQ2HW
ZB1AJX
ZC4IP
ZE1JI
ZE5JA
Z86RI
Z85FS

• 105
W1BGY
W1KMY
W1KYK
W1MLG
K2DSW
W2CUQ
W2GBX
W2KJZ
W2LRJ
W2NUO
W2QXB
W2RK
K2VFR
W3GTL
W3QOR
W3QQL
W3TLN
W4DYM
W4EBO
W4HKQ
W4WDI
W4YDT
W5WW
W6CPL
W6DFY
W6DOT
W6EYY
W6KPC
W6MCY
W7BAJ
W7PGX

W8AQ
W8QZB
W8ZPX
W9BPW
W9CMQ
W9DUY
W9FID
W9YFT
CT1ER
DL1SD
DL3BJ
DL3FL
DL7FU
DL9PR
FA3OA
G3GYH
G3HLY
G3ID
G3JEQ
G3JW
G5US
G6CB
G6IC
G8QW
GI3AXI
GM6MS
GW3JI
HB9BZ
HB9PV
HR1AT
HZ1KE
JA7AD
LA1MB
MI3ZJ
OE1WH
OE2SP
OE3VP
OH1OY
OH2IK
OH3NA
OH3PB
OH3UO
OH6NZ
OK2OS
OK2XF
OK3EA
ON4IV
ON4TQ
PA0ALO
PA0JV
PY1MK
PZ1AH
SM4AWW
SM5AQB
SM5EC
SM7BHF
VE3ANH
VE3IG
VE3KE
VE3YV
VE6AO
VK2ADE
VK2BA
VK2PV
VK6DX
VP5DC
VS1FJ
YN1PM
YU2CF
YV5AO
ZK2AA
ZL1RD
ZS4PB
ZS6QF
ZS6SB
ZS6XQ
4X4FA

• 104
W1AFB
W1BPW
W1DF
W1NYA
W1TBY
W1ZTQ
W2BUV
K2EGI
W2QQ
W2RWN
W2TSL
K2YOR
W2ZXL
W3DFY
W3IBT
W3ITW
W3OVU
W3RXM
W3ZKB
W3ZKH

W4AWS
W4COI
W4DMB
W4FNQ
W4IPR
W4JJL
W4KYI
W5JSB
W5OFM
W5TOU
W6CTO
W6DYP
W6EJA
W6JVA
W6KRI
W6MUC
W6WWW
W7GWD
W7KEM
W7LIO
W8BWS
W8DSZ
W8DUA
W8ELB
W8ELL
K9DSF
W9EHU
W9FJY
W9GA
W9HCR
W9KYK
W9TFU
W9TKR
W9UXS
W9BAF
W9DAO
W9DSO
W9GNG
W9GXI
W9GYL
K9ITF
W9JJY
W9SQO
DL1FL
DL1PV
DL1SF
DL3ND
DL4IH
DL9VR
FE8AE
FR7ZA
G2CLL
G2FQP
G2RF
G3APX
G3AZ
G3CQF
G3FJ
G3HHV
G3IEW
G3JHZ
G3JLB
G3KHE
G6FB
G8PW
GM3ASM
GW3DOF
HB9MO
JA2JW
JA5AA
KG6GU
KZ5IF
OA4C
OE3RE
OH1OW
OH7OU
OH9OB
OK1NS
OK1OP
OK1PN
OK1XQ
PA0LB
PA0OI
PA0ZV
PY2OE
SM2ALU
SM5BGS
SM5CHG
SP2AP
SU1AD
TA3AA
TF3SF
TF3SG
VS1GX
VU2MD
YV4AU
ZL3HC
ZS5U

• 103
W1ALK
W1IAP
W1NF
W1QXX
W1TKC
W1UMC
K2BJA
W2BPA
W2GKE
K2HXL
W2JJC
W2KIR
W2PIN
W2UPH
W2WFC
W3EIV
W1HMP/3
W3KMS
W3LTW
W4FZO
W4KVX
W4VBR
W4VZQ
W4ZPX
W5DF
K5IIX
W5MMD
W6BAX
W6BZ
W6DAC
W6GHG
W6JWL
W6KUR
W6LMV
W6MLY
W6NWI
W6VBI
W6VJW
W6WB
W6YRA
W6ZZC
W7AEA
W7BSP
W7DXZ
K7FAE
W7GEB
W7TJ
W7TPE
W8CFX
W8CLM
W8TLL
W8YLJ
W8ZIF
W8ZNO
W9DPY
W9RCQ
W9RH
W9SOA
W9VFZ
W9VL
W9VZP
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W0SMV
W0SNL
W0IFW
CE3CK
CM2SW
CN8MZ
CR7BN
CT1BQ
DL1BZ
DL1EV
DM2ABL
DM2ADL
DJ2IV
DL3ZF
DL4FS
DL6NB
F8DB
FA8RJ
G2AFQ
G3CXM
G2KI
G2SA
G3DAH
G3EFY
G4JJ
G5JM
G8PP
G8PG
GC4LI
GI3JXS
GM3AWW
GM3DZB
HB9HC
HB9NQ
HB9OQ
HB9TT

I1AFM
I1ARA
I1CUC
I1NU
I1UV
JA1AB
JA5AF
KH6CBP
KP4HU
KT1OX
LA3Y
LU5ABL
MD1D
MD5KW
QH2LU
OH2MQ
OH2LX
OH3OD
OH3TH
OH5NK
OH5OU
OH6OA
OH9PF
OK1LM
OK1NC
OK1VA
OK2SO
OK3IA
ON4FU
ON4JU
PA0LY
PA0IV
SM5AFI
SM5AJU
SM5AOI
SM5HH
SM6AMR
SM6AOU
SM6AWE
SM7BIP
SP3PL
VE3AHU/SU
VE1BK
VE3BWY
VE3BZ
VK3AHH
VO6U
VP5BL
VQ2DC
VQ4HK
YU3AB
ZB1AH
ZL1CH
ZL3IA
ZS1BM
ZS3BC
4X4BN
4X4FS

• 102
W1AOQ
W1ASJ
W1CEG
W1CNC
W1OHA
W1PWK
W1RLQ
W1SU
W1WTE
W2AJ
W2FCQ
W2GJD
W2HQB
W2HY
W2JA
W2JME
W2UOL
W3EDJ
W3GGT
W3PA
W3SKQ
W3WQN
W4INL
W4KKX
KN4RID
W4SXE
W4VOS
W5BDI
W5BHV
W5FXP
W5OVJ
W5ZWR
K6AAJ
K6GCF
W6KNM
W6ONK
W6PHN
W6SIJ

W6TGH
W6TMX
W7AGS
W7UVH
W7WZW
W8AAP
W8AVB
W8CEI
W8HZR
W8JRB
W8KBT
W8LYQ
W8NP
W8YJE
K9ECO
W9FAU
W9GIH
W9GMZ
W9HYM
W9LIL
W9NXU
W9RMH
W9UDK
W9VW
W9WHF
W9YMG
W9YYG
W0FET
W0REP
W0ZDM
CE5AW
CR4AD
CX6AD
DL1AT
DL1EI
DL1IN
DL3BV
DL3HZ
DL3LL
DL3LM
DL6GP
DL6MU
DL6OS
EA8BF
EI6G
EI9J
ET2PA
F8DU
G3ATU
G3CFK
G3CVG
G3EYN
G3FML
G3FPQ
G3HFJ
G3HK
G4JB
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G5SX
G6XS
G8FC
G8TY
G8WF
GC2FZC
GI3GAL
GM2FHH
GM3HQN
GM3RL
GM3WO
GM8CH
GW2CPU
GW3AHN
HB9QO
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I1KZ
JA2AT
JA2BL
JA4BB
JA6AK
JA9AA
KG6GC
KG6GD
KP4DP
KP4QA
KS4AI
KZ5AU
LA8F
LX1AS
OE1AD
OE1ZZ
OE5BG
OE5BW
OE6RM
OE13USA
OH2XK
OH2ZE
OH5OP
OH9NV
OK2EL

OK2MA
OK3AL
OK3DG
OK3MM
ON4MN
OZ2KK
OZ2LX
PA0RU
PA0SU
SL3AG
SM3FY
SM4AEE
SM5AUP
SM7AAZ
SM7AKO
SL7BT
SV0WL
TA3FAS
TI2BX
UA9DN
VE1BV
VE3BUR
VE3QE
VE3RM
VE6FK
VE7OJ
VK2YC
VK2ZH
VK4SS
VP9BM
VQ4KPB
VR2CG
YI3BZL
ZL2BH
ZL3CP
ZL4DV
ZS2FH
ZS3S
ZS5IO
ZS6VR
4X4CZ

• 101
W1FPS
W1GFH
W1GVZ
W1IKB
W1KNU
W1MLT
W1NAV
W1NMP
W1ODY
W1UCA
W1VFK
W1WVY
W2AXU
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W2EQG
W2FCT
W2FXO
W2ILN
W2IYG
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W2KXK
W2LYO
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W2PUX
W2QZI
W2TNA
W2UZF
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W3CSS
W3HDV
W3HVM
W3IL
W3KAT
W3NFB
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W4USQ
W4VNE
W4VPD
W4WSJ
W4ZCB

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W5QF
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K6DDO
W6DLX
W6HNX
W6HOH
W6JDO
W6JFJ
W6JRY
W6KIQ
W6KTW
K6LZI
W6MUM
W6POZ
W6QWV
W6RCC
K6RWO
W6SC
W6TBP
W6TEU
W6TMP
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W6VAT
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W7CNM
W7ETK
W7HYW
W7KSA
W7LYL
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W7PB
W7YAQ
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W8MTQ
W8PM
W8SMC
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W9VTI
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K9DRR
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W0FBT
W0FLK
W0IEL
W0LVA
W0VDC
W0ZQV
CE3AX
CN2AP
CO2OM
CT1AS
CT3AA
DL1CR
DL1ES
DL1LZ
DJ1MI
DL6CV
DL6GH
DL6SS
DL7BC
DL9LB
F3BR
F3YP
F8IW
F8PA
F9AG
F9BC
F9FK
FE8AB
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G2DVD
G2WQ
G3ADG
G3AWL
G3BQR
G3CDC
G3CHW
G3CJY
G3CSE
G3EBH

G3EEB
G3GAF
G3HEP
G4GI
G4GJ
G4LP
G5RM
G6XY
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G8NV
G8TS
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GM3GJB
GW4CX
HB9BX
HB9EW
HP1EH
HP1GD
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JA1ACA
JA8AQ
KH6DKA
KH6EL
KH6LF
LA6O
LU5AH
OE1FT
OE3ED
OE5PV
OE8FK
OH1PI
OH2YV
OH5OT
ON4RM
OZ1W
OZ4FF
PA0FD
PA0MOT
PA0ZE
PK6HA
PY1ARZ
PY1KJ
VE1CU
VE1OK
VE1OM
VE2ATD
VE5DR
VE6JR
VE6MN
VE6MZ
VK1EG
VK5MF
VK8AB
VP8AK
VP9OO
VQ4EO
VQ8CB
VS7NG
YU2DU
ZE3JL
ZE4JC
ZL1PO
ZL2GH
ZS4FP
ZS5AW
ZS6CT
ZS8OS
ZS6AEA
ZS7C
4S7MR
9S4CH

• 100
K1AHS
W1BUX
W1COM
W1CPJ
W1DBA
W1DWH
W1EQ
W1EYP
W1GOF
W1GYE
W1IOZ
W1ISX
W1LOS
W1MAN
W1NEP
W1PPZ
W1UBC
W1WPO
W1YQF
W2ADQ
W2BYN
W2CBS
W2HYV
W2HZN
W2IP
W2JJI

W2KGN
W2KTF
W2LRW
K2MPB
W2OQO
K2PFC
W2PGU
W2SGK
W2TJK
W2UA
W2VCZ
W2ZQW
W3AFM
W3EH
W3ETD
W3EWR
W3FJU
W3HA
W3HQU
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W3KA
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W3ORU
W3SJK
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W3YZI
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W5ZSX
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W6DUC
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W6EKC
W6GHM
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K6HFB
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W6PYE
K6TXA
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W6VBY
W6VZG

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W6ZTW
W6ZZ
W7FMX
W7IAA
W7IEE
W7JUO
W7KEV
W7LYU
W7ONG
W7VIU
W7ZOH
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W8AL
K8CFB
W8FJR
W8HSW
W8ICC
W8IQS
W8IV
W8JGU
W8JM
W8LCN
W8LFJ
W8LYP
W8MFW
W8NKU
W8OPG
W8QQH
W8QVU
W8SSI
W8VVD
W8VZ

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W9BEM
W9CAS
K9DNR
W9ESD
W9FBI
W9FYM
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W9IZ
W9JNB
W9LNQ
W9OMZ
W9POC
W9PWM
W9QLW
W9SZR
W9TPA
W9UAZ
W9VOD
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WØBFY
WØBMQ
WØDRG
WØFFV
WØFWW
WØFXI
WØIJW
WØLBS
WØTXW
WØUCG

WØWHW
CE6AB
CN8BP
CO2BM
CR9AF
CR7CI
CT1FM
CT1PJ
CT3AV
DL1AG
DJ1BZ
DL1DC
DL1IP
DL1VR
DJ1VS
DL1YY
DM2ACM
DJ2BC
DL3CM
DL3KN
DL3LB
DL3NX
DL3OO
DL3RM
DL4MW
DL6CL
DL6TW
DL7DA
EA2BL
EA9DF
EAØAB
EI3S

EI8S
EI9Q
F3II
F3TX
F5ZU
F7BO
F7DB
F7ER
F8PI
F9OQ
FG7XA
G2AO
G2AOW
G2BJY
G2GM
G2NS
G2ZZ
G3AAG
G3ACC
G3BDS
G3BNE
G3CWW
G3CWZ
G3FPI
G3GZJ
G3HCV
G3HYM
G3IAD
G3KGV
G3TC
G3VW
G5CR

G5JL
G5WC
G6AX
G8JO
G8JR
G8LG
G8UK
GC2AWT
GI3BKG
GI4NU
GM3EDU
GM3EFS
GM8AT
GW5FN
GW8UH
HA5AM
HB9DH
HB9DK
HB9EC
HB9TE
HC2KJ
HC7KD
I1PL
IT1ZGY
KH6AUJ
KH6SO
KL7PJ
KL7UM
KP4ABD
KZ5GF
LA1RD
LA2MA
LA5DB

LA5R
MP4QAL
OA4AK
OE1GZ
OE1KF
OE1TA
OE3AS
OE3BE
OE3BMB
OE5LV
OE8KI
OE8SH
OH1TM
OH2VN
OH2WM
OH3SO
OK1GT
OK1WF
OK3HM
ON4CY
OZ4KX
OZ4PA
PAØBK
PAØBX
PAØHG
PAØUV
PK4KS
SM3ACP
SM5BPJ
SM5IZ
SM7IA
SP1JF
SP5AR
TF3AR

VE1EA
VE1GJ
VE1NE
VE1YB
VE2AFC
VE2KZ
VE3ARS
VE3BMB
VE3OR
VE3QB
VE5VL
VE7AAD
VE7CN
VE7EH
VE7ZK
VK3RJ
VP2LU
VQ4BU
VQ4HJP
VS1FK
VS6BA
YO2BU
YS1O
ZB1CR
ZL1AOO
ZL2AFZ
ZL2FI
ZS6AJO
ZS6DG
ZS5KF
ZS6IH
ZS6OW
4X4DR

RADIOTELEPHONE

• 282
PY2CK

• 275
W8GZ

• 272
W1FH
VQ4ERR

• 269
ZS6BW

• 268
W3JNN

• 267
W8HGW

• 266
W8BF

• 261
W9RBI
CN8MM

• 260
W6AM
CX2CO
ZL1HY

• 259
W8KML

• 258
ZL2GX

• 257
W9NDA
4X4DK

• 253
G2PL

• 250
W6YY

• 242
W8BKP

• 241
EA2CQ

• 240
KH6OR

• 239
W8BGP

• 234
W1NWO

• 233
W1JCX
WØAIW
G3HLS

• 230
W8QJR
W8UAS
I1SM

• 228
W2BXA
W6DI
W9WHM

• 227
W8DMD

• 226
W4HA

• 225
TI2RC

• 224
W3GHD
W6GVM

• 223
VE3KF

• 222
W5JUF

• 221
SM5KP

• 220
W1MCW
W6SYG
W9RNX
G4ZU
SM5ARP

• 219
CO2BL
TI2HP
ZS6Q

• 217
I1AMU
LU4DMG
VE7ZM

• 216
W3DHM

CT1PK

• 215
K4AIM
PY4CB
XE1AC

• 214
W3KT
W5EFC
G3DO
ZS6DW

• 213
CO2BK
PY4KL

• 212
W3ECR
W6IBD

• 211
W8VDJ
WØGKL
HC1FG
ZP5CF

• 210
W2AFQ
W2PTE
W5KBU
W7HIA
EA2CA

• 208
W9YSX

• 207
W6KQY
W7HTB
KV4BB
PY2AHS
ZS6FN

• 206
W5ASG
W6MBD

• 204
W1CLX
W9BVX
W9QLH
G5VT

• 203
W4DQH
W8EWB
W8JIN
G3FNN

• 202
W1PST
W2APU
W2PUN
W4ANE
W4ESP
W7PHO

• 200
W4NYN
W9FDX
LA5YE
PY1NC
PY4TK
VE3QA
ZL1KG
9K2AZ

• 199
HB9J
YV5AB

• 198
W8JBI

• 197
W3BES
W4TO

• 196
W1ADM
W4DCR
W9JJF
SM5LL

• 194
W2WZ
PY4PI

• 193
W4OM

• 192
W5ALA
W5GXP
PY1AQT

• 191
W3AEV
W4MKB
W5NMA
HB9ET

• 190
W1MB
W4EEE
W5YLL
W6SAI

WØVSK
DL3IR
F9HF
YV5EC

• 189
W4JGO
W7ADS
CT1CL

• 188
W4AZD
W5TIZ
W7MGT
W8CLR

• 187
CX2AX
G6BS

• 186
G8IG
TI2TG

• 185
W5HJA

• 184
W1BLF
W3UIP
PAØNU
PY4ZS

• 183
W6CHV
W8ZOK
W9YFV
F8CW
VQ2DT
ZS1DO

• 182
W2JT

• 181
W9RRX
VE3AIU

• 180
W1EKU
W1GOU
W2JY
W3FGB
W3MAC
W4ADY
W5VU
CE3AB
F9RM

OD5AB
ON4DH
PY2JU
PY4VX
SM3BIZ
TG9AD

• 179
W4NHF
I1AOF

• 178
W3VKD
ON4DM

• 177
W4TFB
W8AJW
G6RH

• 176
W1FFO
W9ROQ
HC2JR

• 175
W2ZX
W3GHS
CE3DY
LU8CW
OZ3Y
PK4DA

• 174
W1ATE
W3LOE
WØJYW
CE3HL
ZP5ET

• 173
CR6BX
CX3AA

• 172
W4EWY
LA7Y

• 171
W1LMB
W3NA
G3BID
PY7VG
VS2DQ

• 170
W1HX
W2BQM
K2CJN

W2HTI
W3HIX
W4AAW
W6QOG
W7MBX
W9HB
WØHX
WØNCG
CN2WX
F8LE
G3AIZ
HB9LA
OZ7FG

• 165
W2AEB
W5PQA
W6AED
W8NGO
WØIEV
ON4SZ
TI2LA

• 168
W1AUR
DL7BA

• 167
W3EVW
WØCPM
KZ5DG
ZS5JM

• 166
W1FZ
W5DMR
W6OBH

• 165
W1MMV
W8PWH

• 164
W2AOX
W2EOH
KL7AFR

• 163
W3IMV
K4BVQ
W8SDR
W9HP
G2BXP
LU4MG
ZP5EC

• 162
W2JIL
W8IUA

F8PQ
G5RV
I1CAR

• 161
W1ENE
W5GNG
W5MMK
F3DJ
F8XP
G2ZB
I1ASM
I1BIC
I1YJ

• 160
W2FXE
W4CFD
W5ALB
W5KC
W7EMP
W8BGU
W8MWL
W8NXF
W8WZ
WØEHF
DL1LH
DL4BY
G6AY
LU4DD
ON4PJ
ON4YI
VE3BDB

• 159
WØGEK
I1CTE

• 158
W2CKY
WØKOK
WØSYK

• 157
W4CYU
EA2CB
G3FXB

• 156
W1QPN
W6TXL
PY4RJ
VE5RU

• 155
K2AAA
W3CGS
W6ITH
W8REU

CX3BH
DL6VM
ON4RC
VE2WW

• 154
PY7YS
SM5WJ

• 153
W4VYP
W6ZEN
WØBFB
G2MI
I1AHW
VP9G

• 152
W1LSZ
W2YYL
W4CWV
W5ERY
W6SHW
W8AJH
W8HBI
W8WT
I1CQD
PY1AGP
PY3AGR

• 151
W1HKK
W1JXM
W2QF
W6CHY
W7HXG
W8EMZ
W8NWO
W8ZET
WØIOS
VK2JZ
ZS3G

• 150
W2PBI
W2VWN
W3BET
W4GMA
W7AUS
W8MRC
W8PUD
W8TMA
CT1MB
GM3AVA
HB9NU
I1RC
PY4LP
VE7AIH

• 149
W8JXM
E12W
I1AIM
TI2OE

• 148
W2LV

• 147
W3BVL
W4DOU
WØFUH

• 146
W6FHR
I1ZCT

• 145
W1FPH
W1LLF
W1QGJ
W4GRP
W6CLS
W9JUV
DL3EA
G3BNC
G8UG
SM5ARL

• 144
W2RGV
W6TZD
W8LAV
G3COJ
HB9NT
HK4DF
OK1MB

• 143
W9BEK
EA3KB
PY1FR

• 142
W1BEQ
W1GKK
W3KVB
W5KUJ
W7HQC
DL7AA
I1BDV
PAØJA

• 141
W2BYP
W2UTH
W4FBH
W4SKO

W5CEW
W5JCY
W5JWM
W6TT
W8CQL
W8YMH
W8ZSZ
CR5SP
CX4CS
G2AJF
G8QX
I1BPW
I1GZ
ON4AR

• 140
W1JSS
W2AKX
W2BRV
W2GIC
W2TQR
W2WCY
W3EQK
W4HRR
W6LTY
W8HUD
W8EZD
W8AGO
W8PRZ
W8QGI
CE3AE
EA4EP
EA8AX
G6LX
GC2RS
HA
HVS
KL7AON
KP4ADX
OZ7TS
PY4PQ
SM5RY
VP8SD

• 139
K6LAS
ZP5JP

• 138
K2BZT
W5EB
W8KPT
W8ANF
YE7JB

• 137
W8TJM

• 136
W2PRN
P5EK
A3GI
2WW

• 135
W1ARV
W2ZKG
W3JNM
W3LXL
W6GUV
A9AR
HC2OT
I1THZ
LU8BS

• 134
W4GIO
K6EVR
W8YVV
DL3TJ
G3DPJ
ZE1JE
4X4RE

• 133
W1YPK
W2OFX
W3DKT
W6NIG
W6VSS
CE1AH
EA4CX
EA9BC
I1KDB
I1RM

• 132
W1KJU
W2RTX
W3DRD
W3DYT
K5BEU
W6VFR
W7PEY
W8END
W9IOD
ZS1KW

• 131
W2ZW
W3NKM
W4BWP
W5MZP
W9BAE
W9UUN
F8SK
GM2DBX
HB9FU

• 130
W1PNR
W1VAN
W2DEC
W2NHZ
W3BUX
W3BYL
W3DPS
W4BA
W4EFX
W4IKM
W5HWX
W6NOT
W6WNH
W8GAN
W9BZB
W9GPR
W9PUE
CN8BA
DL1WP
DL3NE
DL3VZ
EA7EM
F8MY
G8KP
I1AXD
I1BXK
SV9FR
VE2GQ

• 129
W2ZVS
W4AQR
W5DQK
DL3DP
PY7VBG
VP6CJ
ZL4BO
ZS6FU

• 128
W3RPG
W4EEO
W8GLK
I1AIJ
LU6DJY

• 127
W9LTR
W9GFO
F8SE
VQ4KRL

• 126
W8CYL
W9PQA
W9MCX
W9QVZ
DL4QH
SM5BBX
ZE2JE
ZS5CU

• 125
W1CJK
W1DCE
W4NBV
W5RHW
W6BCQ
W6MEL
W8EKW
CX5AF
ON4MS
OZ7OP
PY4GC

• 124
W1OHJ
W2QKJ
W3BIW
W4EBO
W9EYR
W9QFQ
CR6AU
EA7EV
GM3BCL

• 123
W2MFS
W8AUP
W8IOO
W9DSP
W9TJ
F9PH
HB9JW
KG6AGO

• 122
W1HRI
W3GEN
W5HFQ
W7KT
WØJRY
WØUYC
EA3IX
G2ALN
G5LN
I1TBU
I1ZV
LU5DC
OQ5LL
VE1NH
VE7VO

• 121
W2TEX
W3MDE
W4BOC
W4DWN
W4HKJ
W4JCK
W4WSJ
W4YHC
K6TXR
W9ABA
W9ICL
W9IHN
W9JLH
W9NLP
CX1AK
G4JW
I1BJC
OH2BE
PAØZD
VE5GF
VK5LC
VK7RX
VR2BC
VS2DB
YV5ABD
ZP5CG

• 120
W1KRS
W1PMZ
W1RZD
W1UWB
W1YZG
W2SGX
W2TXB
W3DWA
W3NIG
W3QMG
W4VCB/3
K4CYF
W4DCQ
W4IYM
W4MB
W4PBH
W5HAD
W5UBW
W5WJQ
W6IKQ
W6MJB
W8BIQ
W8HGA
W8HOY
W8MXS
W8QNF
WØZSZ
WØIGL
CO1AF
CX2CN
DL1SD
FB8BC
HB9DY
HB9RS
I1CHJ
I1RGF
G5PP
I1BRN
ZL1PA
5A1TB

• 119
W1CUX
W4BYU
W5JBD
W7DAA
W8CUO
I1SGZ
LU3DH
LU3PF
PY7VE
VK3BZ
VP5FR
5A1TA

• 118
W1AUF
W1RYJ
W2VQM
W2VYH
W6YI
WØTJ
JA6HK
OD5AD

• 117
W3JZY
W3RUT
W4KAE
W6WTH
W6YX
W9YOR
DL4EA
EA4CM
F8SC
I1ASO
Z82AT

• 116
W1DBM
W1NBI
K2JGG
W3HYH
W4QT
KØACC
F3WV
G2HIO
I1BSB
LU8FP

• 115
W1LHZ
W1RLV
W2IHX
W3AOH
W3RIS
W4BVX
W4PYX
W6NJU
W7GUV
W8HRV
W8KOE
WØJFI
WØMAF
I1ZFT
IT1TAI
LU3FAQ
OK2AG
OZ3TH
SM3EP
VE6NX
4X4CX

• 114
W2GLF
W6IDY
W8ZMC
WØDST
ET2LV
GM2UU
PY4EM
I1CBZ
TI2EV
ZS6NZ

• 113
W1MIA
W1YXD
W3MMH
W4WM
W5JJA
W7GBY
W8CJ
W8JXY
WØVAF
G2FRL
G5PP
I1BRN
ZL1PA
5A1TB

• 112
W1BIH
K2IGO
W2IUV
W3UMU
W4IYC
W4KGB
W4MRA
W7EKA
W9BVM
DL6PC
G4JZ
I1PDN
OQ5FH
OZ5KP
ZS6LW

• 111
W1JYH
W1LIB
W2PRF
W3OGR
W3POG
W5YKK
W6BSY
W7MBW
W9CZC
W9JYU
W9UZC
DL1FI
F8TP
F8VU
I1BAF
I1BT
I1BWN
PAØTV
PY1ANU
VE3AAZ
VE3TW
VE7MS
VU2EH
YK1AC
ZS2IW

• 110
W1HN
W1UQW
W1WQC
W2CGP
W2GX
K2QQQ
W3HUV
W3MJF
W3MS
W4IQG
W4YQB
W5ZUI
W6DLN
W6LHI
W7LVR
W8FSK
W8BFQ
W8DMJ
W8EAP
W8GUZ
W8LJ
W8QAD
W8VQD
W9HPS
W9UMJ
W9ZUL
WØWMA
WØWXJ
WØWYV
CT1DX
CT1NT
EA2DJ
EA5BD
EI4Q
G2AFQ
G3JHI
G3YM
HK4CO
HP1BR
I1FLD
LU3EB
OD5BA
OH5PE
OZ7SM
VE3KT
YV5BS
ZS1GG

• 109
W1KWD
W1RIL
W4NDE
W5DJH
K6CCV
CQ2OZ
CT1PR
DL4TL
DL9GU
EA4DB
EA6AR
HB9CX
HB9ID
I1BNU
I1ZFF
PAØOTC
PY2AK
TG9AZ
ZS6Z
4X4FF

• 108
W1BAV
W3KTF
W3MWP
K4EJO
W4LIM
W7GJ
W8RVU
W9DOR
WØMVO
F9EZ
I1RLH
OZ5BW
VE3EHR
YV5GY
ZS6GU

• 107
W1OOS
W2DCO
W2RUI
W4LZM
W7HLB
W9MKJ
WØCXC
DL7CX
EA3FG
G4MS
G5OO
HB9JZ
IT1AFS
OA4AO
OH5NW
PY4APF
PY6CO
4X4BL

• 106
W2IWC
K2JFV
W3AER
W4BHI
W4LRG
W5BQJ
W8GAH
W6ZWK
W7AHX
W7RSP
W7TMF
W8KMY
W8SDD
W9DPI
DL1FK
DL7EX
F8YE
F9HE
G8VB
HK3PC
HR1EZ
I1CWX
I1CXJ
I1ZQ
LU3MZ
SM5BAF
T12OA
VE5JV
VK3JE
VQ5EK
YN4CB
ZL2ANZ
ZL2JB
4X4BO

• 105
K2GSO
W2JJI
W2ONV
W2OXR
W3CUB
W3JTK
W3ZQ
W4ZMC
W5JUE
W5RNG
W6BJU
W6UYX
W8GNY
W8JWV
W8RNB
CX6BM
DJ2YI
DL4KD
F9QP
FA8RJ
G2MQ
G3ESY
I1CCO
I1KRV
OH1TX
OH3RA
SM5RQ
SU1HF
VE1FQ
VE7YR
VP8GT
ZD6RD
ZE2JK
ZS6WS

• 104
W1BFT
W1BPH
W2PFL
W2PPS
W2SNI
W4AHF
W4EYH
W4TWW
W8ACP
K8ADY
W8CQ
W8KDJ
W9EU
W9FHZ
W9LXQ
W9ZNY
WØAWK
WØSFU
WØUUE
CE3AG
CX2AY
EA4CK
EA7EU
EI2L
EI3S
EI6X
F3OX
G2ALO
G6TA
G8QW
I1SGA
I1TDJ
I1ZJG
KV4BI
LU4ES
LX1SI
OE3ME
PAØAGR
PY3DP
SM6SA
VE2BR
VE3VO
ZD4AH
4X4FV

• 103
W1JYQ
W1PDF
W1YQC
W2DPS
W2ESG
W2IZS
W2NQR
W2QWS
W3PQB
W3ROA
W4AYF
K4CKZ
W4SBX
WØGPB
W6NGA
W8NOH
W9EWC
K9EWL
WØZPT
WØAXE
WØUQD
F3DG
DL3RM
DL4OR
DL4UZ
DL7CE
G2AKR
G8SC
GW3CDT
HB9KU
HK4FV
I1KP
IS1AYN
IT1CDS
KG4AP
OE5CK
OH3PB
PY6CN
VQ4SC
YS2AG
3A2BF
3V8BB

• 102
W2CCO
W2DSB
W2DYR
W2GBC
W2GNQ
K2QXG
K2LGS
W2PBG
W2QCP
K2QXG
W3AZD
W3BYI
W3FGN
K4IOT
W4KYB
W4PRM
W5NXE
W6PWR
W7YAM
W8IWI
W8MWZ
W8UUI
W8UPN
W9BUJ
W9PWL
W9WXT
W9YRO
WØMLY
WØSQO
WØSUG
WØVBQ
WØWSH
CN2AK
CO7GM
CT1DU
CT1ER
CT1FL
CX7BA
DJ2MM
DL3DO
DL3TM
DL7AB
DL9OV
EL1H
F9SH
G2ACK
G2DP
G3CCO
G3HRO
G3XC
GC6FQ
GI6TK
GM3CIX
GW8BW
HB9HM
I1AUH
I1BFS
I1ZZG
JA6AK
KL7ZG
KP4ES
LU9DM
ON4LJ
OZ2JF
PAØMDW
PY2BCB
PY6RZ
TA3GVU
TI2RAF
VE3AUJ
VE4RP
VE6TF
VE7HC
VE7SB
VS9AH
XX2SY
YO3VI
ZD1SW
ZL3LR
ZS5G

• 101
W1QWU
W1RFE
W1UMC
W1YWU
W2LSX
K2PIC
W2UAT
W2WME
W3SFK
W4DEO
W4GNT
W4IIB
W4KZF
W4LPT
W4N2M
W5HWK
W5JRF
W5LFK
W5ZS
W6BYB
W6KPC
W6PKI
W7DND
W7JNC
W8HTP
W8NML
W9ICF
W9LQ
WØLIL
WØMKF
WØNWW
WØQZ
CN8GT
DL2UZ
EA3HL
ET2MZ
F3PW
F9AA
G6WX
HB9BR
HK1DZ
I1BEM
I1CSP
I1KZ
I1NK
I1QQ
I1RB
I1WAL
KA2AL
KL7ALZ
KL7BHE
KL7PIV
KP4EZ
KZ5DX
LU5AR
OA5G
OD5AU
OE1PC
OH2OV
PAØCM
SM5WS
SM5XP
VE1DR
VE2AHE
VE3BQP
VP6WR
VP9L
VS1AY
YK1AA
4X4AD

• 100
W1BAN
W1FQX
W1KTV
W1MLM
W1OHA
W1REP
W1VFK
W1WTF
W2APF
W2BTV
W2BZN
W2CFT
W2DSU
K2EFB
W2FZO
W2GFH
W2LXT
W2KSN
W2MA
W2OR
W2PQJ
W2SKE
W2VCZ
W3ALB
W3AM
W3AZQ
W3DZZ
W3ELH
W3OJW
W3PA
W3RVM
W4CRI
W4DCW
W4DSC
W4UAT
W4ECE
W4ENH
W4EYG
W4GLR
W4LGG
W4NQN
W4NYX
W4PGZ
W4RVL
W4UKA
W4UWC
W4WW
K5CAI
W5GZ
W5NW
W5NXF
W5SFT
W5URU
W6EHN
W6GRV
K6KJR
K6LGF
W6NGZ
W6OZE
W6UZX
W6ZTW
W6ZZC
W7ADH
W7TGG
W8ALC
W8BRA
W8CSN
W8DXO
W8FJX
W8RDX
W8TOZ
W8UMR
W8VGQ
W9CKP
W9EVI
W9GPI
W9GZK
W9HMG
W9IGK
W9JQQ
W9QYH
W9SD
W9UJ
W9VQG
WØDIB
WØDXE
WØGSW
WØHRY
CO8JK
CR6AG
CT1QF
DL4SK
EA1GH
EI4L
F3NG
F7AX
F8WE
FS7RT
G2HIF
G2LS
G2VJ
GM3DZB
HC2BH
HP1GD
HR1LW
I1BNC
KP4HZ
LU8FAO
LU9FAY
LX1DC
OE1FF
OE5YL
OH1PN
PAØQJ
PJ2AF
PY1FT
PY1RC
SM4BMX
SM5FA
SM6OE
SP7HX
SU1AS
VE3AOL
VE3MR
VP1EK
VP5AR
VQ5PBD
XE2KW
YN1RA
YO3CV
YU1AG
YU2DB
ZL4IG
ZS1MQ
ZS3AB

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Richard B. Mestrov, W3JNQ—SEC: DVB. RM: AXA. PAM: TEJ. The E. Pa. Net meets Mon. through Fri. at 1830 on 3610 kc. The PFN meets Mon. through Fri. at 1800 on 3850 kc. PDJ resigned as RM because of business pressures, and AXA has returned as the new RM. Many thanks, Dick, for a job well done. The c.w. and phone nets both need outlets through the section, especially in the Philadelphia Area. If interested, contact the RM, PAM or SCM. BQA worked 10 new countries during September using his DX-100, bringing his total to 162. EAN has his Apache 2/3 finished. CMN is building an electronic key. BUR put on a c.d. demonstration for his borough. WHK is practically QRT because of school. DVX received WTPA (Worked Two Punxsutawney Amateurs) No. 5. KN3DTL is on, via the help of SOC. UXX needs only a Zone 23 card for WAZ. ZSX is chasing his WAPC Award. VZC has given up mobile and has a Valiant and an HQ-150. GTQ has moved to Binghamton. FWI is now mobile. EFA has a new three-element 10-meter beam. NWJ has a Valiant and a DX-100. K3ANS is QRL with school work. HNK now has 100 per cent modulation on his peanut whistle, built by HNK and JVY. FCI is preparing to enter Penn. State. CUL finds that c.w. still can handle traffic better than s.s.b. and is rebuilding her antenna system. OM VR again sneaks into the shack and handles his own traffic. DHJ is operating from ZA/3W on 14-Mc. s.s.b. K3ALD has worked 63 countries and was in the W/VE Test. EU is a "granpaw." The Lancaster RTS started code classes with 25 in attendance. VBI moved to Williamsport. EYY is recuperating from surgery. OLV turned in his usual good score in the V.H.F. Contest. KJJ is DXing on 15 meters and now has worked 180. IVS's XYL passed her Novice Class exam (given by NIH) and is awaiting a call. FYR is building a preamplifier for his Viking II to improve the audio. NOH is putting up a new tower and 3-band beam. UQV is married. K3AUW dropped the "N." DVB is QRL studying, teaching and with AFMARS. New officers of the Mike Farad RC are LJA, pres.; 4DAB/3, vice-pres.; AHZ, secy.; YFF, treas. EPL, GCC, ERJ and ATB put on a 10-hr.-day demonstration at the Bloomsbury Fair. The Short Skip RC held its annual picnic Oct. 12. JNQ lost his appendix Oct. 11. Traffic: (Sept.) W3CUL 2077, VR 195, TEJ 169, WHK 142, IVS 140, BNR 91, MJM 90, AXA 76, UIU 65, ZRQ 60, BFF 48, K3ANS 32, W3HNK 32, BUR 29, ZSX 24, AMC 22, K3ALD 21, W3FKE 21, NF 21, K3BKT 14, W3NQB 11, LHA 10, FCI 7, K3AFW 5, W3FYR 4, PVY 4, DUI 3, EPL 3, ID 2. (Aug.) W3WHK 318.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Louis T. Croneberger, W3UCR—Asst. SCM Delaware: Ray deCourcelle, 3DQZ. SEC: YYB. Section Nets: MDD, 3650 kc. M-S 1915, MEPN 3820 kc. MWF 1800, SS 1300; DelEN 3905 ks. Sat. 1830. New appointments: IWJ as OO. Your SCM had the pleasure of speaking to the BARC at its Sept. 15th meeting on "ARRL Appointments by the SCM." Mr. Art Miller, Disaster Service, Baltimore Red Cross, thanked the club members (BARC) at the same meeting for assistance in its recent disaster drill. UCR had the opportunity to present the new SEC (YYB) with his certificate and to meet many of the BARC members. RCARA had "Tape Shorts of the National Convention Highlights" at its Sept. 12 meeting. On Sept. 26 KN3DZW spoke on "His Experiences in Korea," which was illustrated by color slides. The Greenbelt ARA elected FVO, pres.; GID, vice-pres.; JSK, secy.; and IWJ, treas. The ARA held its Annual Hamfest at Cunningham Falls and had a nice turnout. The MEPN has adopted a revised emergency plan. Copies may be obtained from JNX. The WMRC has adopted an emergency alerting plan. The HCARA (K3CJT) notes that the members are monitoring 145.68 as well as 29.590 Mc. OPO has assumed duties as NCS for the "going-home crowd" on 29.520 Mc. (WMRC net frequency). New MDD members earning net certificates are K3BUV, CQX and QCW. K3BCA is Acting Novice Coordinator of the ARA and reports the Antietam Novice Net will resume its full fall schedule on 21.150 Mc. EDA gave a talk on amateur radio to the Hagerstown Civitan Club, which resulted in good publicity in the Hagerstown newspapers. CVE reports publicity for PG Co. in the Oct. S.E.T. MCG and MSK are off again for Fort Churchill, Canada (VE4), for a couple of months. PQ will be Acting RM of MDD during Karl's absence. BKE reports a new Apache transmitter now is on the air. JZY reports receiving his WAZ and his antennas are back up for the winter season. New Novices are KN3s DUM using a DX-40 and an AR-3, GIT with a DX-40 and a Super-Pro, GJV on 2 meters with a Sonar rig, EFR and GMB. K3DEI is now General Class. G6VX was a recent visitor to the shack of MSR. YYB and JCL were co-chairmen of the amateur radio station activity (BARC—W3FT) held in Edmondson Village Sept. 18 through Oct. 18. Much traffic has been handled by the station and many have been acquainted with amateur radio for the first time. Congratulations to the BARC on a very fine project. Montgomery Co. RACES, in conjunction with the CAP and the Red Cross, conducted a special blood drop on Sept. 14. CKR and OMN coordinated the activity, with MLM, OBR and K3AUX participating. GKP reports good conditions on 2 meters the Labor Day week end, working 4AIB (South Carolina), 4EQM (Alabama) and many New England and W8 amateurs. UTR now has some antennas up through the efforts of K4LMB's group and some members of the RCARA. EDA has a nice trip to KP4-Land, visited KP4s AEQ, ABD, VJH and MS and was met at the airport by AND. BCB has started a 2-year hitch in the Army. Sorry to report the passing of WN3JVM, the XYL of WN3JVO. Reports of station and club activities should be mailed to reach the SCM prior by the 5th of each month for the preceding month. Club secretaries are invited to send meeting notices, etc., with regular club mailings. This is your column, let's hear from *you*. A very Merry Christmas to all. Traffic: W3UE 340, CVE 188, MCG 167, K3WBJ 154, W3BUD 133, TN 72, COK 68, QCW 60, CN 49, CQZ 6, BKE 4, FNM 4.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. PAM: W2ZI. RMs: W2YRW, W2HDW and W2ZI. K2EFA, Millville, is the new EC for Cumberland Co. With regret I report the passing of W2ASG (an ex-SCM) and W2YT. K2OOK made BPL and again was top traffic-handler in the section. W2HDW, NJN manager, issued a fine bulletin and net roster. K2EVW, Margate, is a fine outlet for shore traffic. W2BZJ, Pennington, has increased power and added a new antenna. W2ZI is moving to a new QTH. Ed was speaker at the October meeting of the Southern Counties Club. K2SOX, Vincentown, is commuting to Margate daily. K2PPT, Burlington, won top section honors in the July CD Contest. W2DBP, W2WKI and K2BG are conducting training classes at the Burlington C.D. Headquarters. K2CPR, Pennsauken, reports his DX score is now 237/228. W2JSL, Hyattsville, Md., is attending school in Blackwood. The SJRA's picnic was a big success with over a thousand attending. W2ESX is SJRA's V.H.F. Contest chairman. K2HPJ, K2GSJ, K2MPV, K2PWV, K2MNZ and K2SJL have dropped the "N." The Burlington County Radio Club has a new QTH. Contact K2INQ, the club's secretary, for information. K2SOW, Princeton, is attending Phillips Exeter Academy. Pennsauken C.D. Headquarters is now fully equipped. K2PTJ is its Radio Officer. W2LS, Pleasantville, continues to do a fine job as Official Observer. All appointees are urged to report their activities the first of each month. Traffic: K2OOK 577, W2HDW 149, K2JGU 100, W2ZI 27, K2PPT 9, K2SOX 9, W2BZJ 5, K2CPR 5, K2EWR 4.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2PPY. RMs: W2RUF and W2ZRC. PAMs: W2PVI and W2LXE (v.h.f.). NYS C.W. meets on 3615 kc. at 1800, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, SRPN on 3980 kc. at 1000, LSN on 3970 kc. at 1900. Appointments: K2IXB as OO Class IV; K2MMI and K2IXB as

(Continued on page 134)

One Thing is *Crystal Clear*—Your Signal

HT-32
transmitter/exciter

Exclusive HT-32 High Frequency Crystal Filter System a major, proven advance... cuts unwanted sideband at least 50 db.

Now Proven superior — vastly superior to any other type filter—is Hallicrafters' exclusive 5.0 mc. quartz crystal filter system.

Result of a three-year research program, the system makes possible, for the first time, *high frequency filtering*. Result: unprecedented rejection of unwanted sideband—50 db. or more—and the *cleanest signal of all*, bar none.

This and another major technical advance—Hallicrafters' exclusive Bridged-Tee Modulator—make the HT-32 the most wanted SSB transmitter in history.

Meets FCDA Specifications

Export Sales: International Division
Raytheon Manufacturing Company
Waltham, Massachusetts

Compare these features

- **5.0 mc. quartz crystal filter cuts unwanted sideband 50 db. or more.**
- **Bridged-Tee modulator; temperature stabilized and compensated.**
- **SSB, AM or CW output on 80, 40, 20, 15, 11-10 meter bands.**
- **High stability, gear driven V.F.O.**
- **144 watts peak power input.**
- **Distortion products down 30 db. or more.**
- **Complete band switching.**

Proof of the HT-32's superiority is heard on ham bands night after night. Listen. You won't be satisfied with anything but the cleanest signal on the air. *The HT-32 is available with convenient terms from your Radio Parts Distributor.*

The new ideas in communications are born at . . .

In our 25th year of service

hallicrafters
Chicago 24, Ill.

Honor is paid to all radio amateurs. In this spirit James E. Harrington, K5BQT, accepts his 1957 Edison trophy from L. Berkley Davis, general manager of the General Electric electronic components division. Left to right: Raymond L. Hufft, adjutant general and civil-defense director of Louisiana; Mr. Davis; Mr. Harrington; Lieutenant General Francis H. Griswold, vice-commander, U.S. Strategic Air Command.

EDISON AWARD NOMINATION DEADLINE JAN. 5

The final postmark date for letters naming candidates for the 1958 Edison Award is January 5, 1959. Only a short time remains to send in your nomination of an amateur who has rendered an important public service.

The judges for the Award will consider only those persons who are named in letters from you and others. Accordingly, you will be serving the entire amateur group by choosing a candidate and writing to the Edison Award Committee about him.

Below are some of the many selfless activities that can make an OM or YL eligible for consideration. For terms and rules of the Edison Award, see the October issue of this magazine, or write to *Edison Award Committee, General Electric Company, Electronic Components Division, Owensboro, Kentucky.*

HERE ARE TYPICAL ACTIVITIES THAT CAN QUALIFY FOR THE AWARD:

Emergency communications work in a disaster, such as a flood, hurricane, tornado, or an explosion.

Helping amateurs and others with their specialized problems, through professional knowledge and experience.

Publishing a book or other literature that contributes to general scientific knowledge or procedure.

Helping disabled or physically handicapped persons.

Relaying messages from remote points for the benefit of isolated servicemen and civilians.

Designing and constructing radio equipment for use by persons in remote parts of the world, who do not have access to regular commercial communication channels.

Civil-defense organization work; weather reporting; radio assistance to state or local traffic and police authorities; cooperation in forest-fire prevention and control.

Teaching young people the elements of electronics.

GENERAL ELECTRIC

11-19-102

new... from Johnson...

A POWERFUL, COMPACT PHONE/CW RIG for 80 thru 6 METERS

Viking

"CHALLENGER"

70 watts phone input 80 thru 6 meters!

120 watts CW input 80 thru 10 meters

... 85 watts CW input on 6 meters!

The new Viking "Challenger" is ideal for fixed station, emergency, portable or field day use. A full size transmitter with three RF stages, the "Challenger" is designed for fast, easy tuning, excellent stability and plenty of reserve drive! A single 6DQ6A buffer drives two husky 6DQ6A bridge neutralized tetrodes in the final amplifier. Hi "Q" wide range pi-network output coupling ranging from 40 to 600 ohms will effectively tune out large amounts of capacitive or inductive reactance. Plate circuit capacitor switching provides the best combination of variable and padding capacity for easy tuning and proper loading. Straight through final amplifier operation even on 6 meters provides excellent efficiency and modulation characteristics—unit is designed for crystal control or external VFO.

Effectively TVI suppressed and filtered. With Johnson "LC" keying to provide true "shaped" CW waveform ... no clicks, no chirps. For crystal or high impedance dynamic microphone. Complete with tubes and built-in power supply.

TUBE COMPLEMENT:

6AU6	Oscillator
6DQ6A	Buffer-Multiplier
6DQ6A (2)	Final Amplifier
12AX7	Cascade Speech Amplifier
6AQ5	Clamper and Screen Modulator
5U4GB	Rectifier

Cat. No.
240-182-1.. Complete Kit.. Amateur Net **$114.75**
240-182-2.. Wired and Tested... Amateur Net $154.75

For easy terms see your Johnson Distributor

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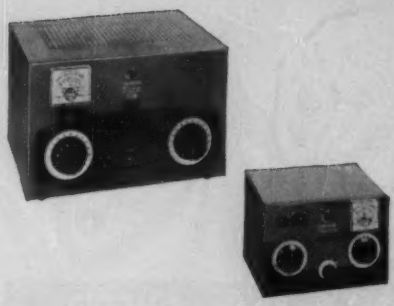


VIKING "PACEMAKER" TRANSMITTER/EXCITER

An outstanding power bargain when used as a transmitter or exciter! 90 watts SSB P.E.P. and CW input . . . 35 watts AM. Unique circuitry uses only 1 mixer for improved spurious signal rejection greater than 50 db. Balanced range audio. Highly stable built-in VFO gives complete coverage of bands without crystal switching or re-tuning. Instant bandswitching 80, 40, 20, 15 and 10 meters. VOX and anti-trip circuits. Wide range pi-network output. Effectively TVI suppressed. With tubes and crystals.

Cat. No. 240-301-2..Wired.....Amateur Net $495.00

VIKING "THUNDERBOLT" AMPLIFIER

Rated at 2000 watts P.E.P.† input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs. —instant bandswitching. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: approx. 10 watts Class AB_2 linear, 20 watts Class C continuous wave. Employs two 4-400A tetrodes in parallel, bridge neutralized—wide range pi-network output. With tubes.

Cat. No.	Amateur Net
240-353-1..Kit	$524.50
240-353-2..Wired	$589.50

NEW VIKING "MATCHBOXES"

Provides completely integrated antenna matching and switching systems for kilowatt or 275-watt transmitters. Units complete with built-in directional coupler and indicator. Bandswitching 80, 40, 20, 15, and 10 meters. Quickly and easily match transmitter to balanced or unbalanced lines over a wide range of antenna impedances will tune out large amounts of capacitive or inductive reactance. No "plug-in" coils or "load-tapping" necessary.

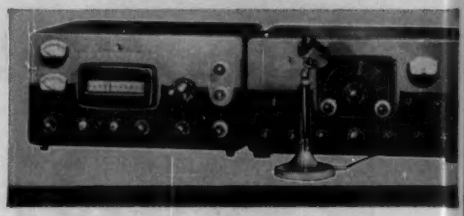
275 WATT "MATCHBOX"

Cat. No.	Amateur Net
250-23-3 With built-in Directional Coupler & Indicator . . .	$86.50
250-23 Less built-in Directional Coupler & Indicator	$54.95

KILOWATT "MATCHBOX"

Cat. No.	Amateur Net
250-30-3 With built-in Directional Coupler & Indicator . . .	$149.50
250-30 Less built-in Directional Coupler & Indicator	$124.50

1st Choice Among the Nation's Amateurs . . . Viking Equipment!



For the strongest signal on the band!

Unequalled 100% broadcast-type high level amplitude modulation! Full 2000 watts SSB† input—1000 watts CW and AM!

VIKING "KILOWATT"

Brilliantly designed, and engineered specifically for high power operation, the Viking "Kilowatt" is the *only* power amplifier available which will deliver a signal with the authority of maximum legal power in all modes!

Class C final amplifier operation provides plate circuit efficiencies in excess of 70%. Final amplifier utilizes two 4-400A tetrodes in parallel, bridge neutralized — wide range pi-network output. Continuous coverage 3.5 to 30 megacycles.

For unsurpassed enjoyment with every contact an unforgettable experience . . . step up to the very finest . . . the thrilling Viking "Kilowatt"!

Cat. No. 240-1000...

Wired and tested with tubes Amateur Net.....$1595.00

Matching accessory desk top, back and three drawer pedestal.

Cat. No. 251-101-1.....FOB Corry, Pa. $132.00

†The F.C.C. permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics. This rating method suggested and approved by Technical Department ARRL.

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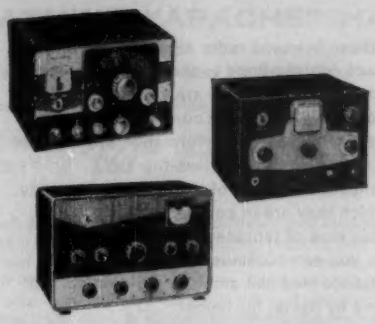


Viking Transmitters —More Effective Watts per Dollar!

VIKING "NAVIGATOR" TRANSMITTER/EXCITER
More than a novice transmitter—also serves as a flexible VFO-Exciter delivering enough RF power to excite most high powered amplifiers on CW and AM! 40 watts CW input—6146 final amplifier tube—wide range pi-network output. Built-in VFO or crystal control—bandswitching 160 through 10 meters. Timed sequence keying. TVI suppressed and filtered. Complete with tubes, less crystals.

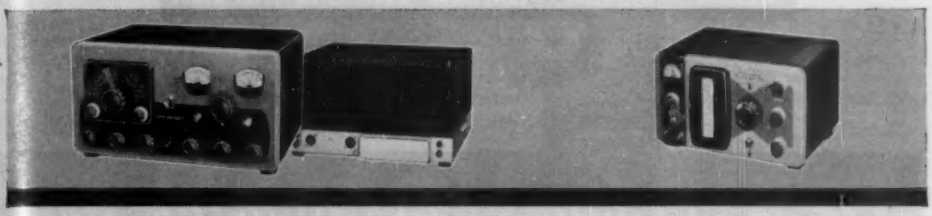
Cat. No. 240-126-1..Kit.....Amateur Net $149.50
Cat. No. 240-126-2..Wired and tested....Amateur Net $199.50

VIKING "ADVENTURER" TRANSMITTER
Perfect for the novice or experienced amateur! 50 watts CW input—instant bandswitching 80 through 10 meters. Crystal or external VFO control. Rugged 807 final amplifier tube—wide range pi-network output. Clean, crisp keying. TVI suppressed. Complete with tubes, less crystals.

Cat. No. 240-181-1..Kit.....Amateur Net $54.95

VIKING "6N2" TRANSMITTER
This compact VHF transmitter punches your signal out with 150 watts CW and 100 watts phone input. Instant bandswitching 6 and 2 meters. Completely shielded and TVI suppressed, the "6N2" may be used with the Viking "Ranger," Viking I, Viking II, or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 output. With tubes.

Cat. No. 240-201-1 Kit.....Amateur Net $129.50
Cat. No. 240-201-2 Wired.....Amateur Net $169.50

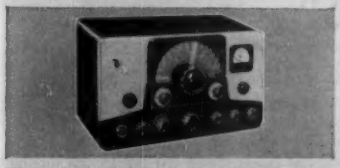


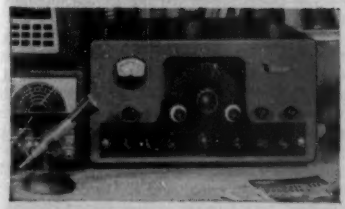
VIKING "FIVE HUNDRED" TRANSMITTER
Rated 600 watts CW input . . . 500 watts phone and SSB (P.E.P. with auxiliary SSB exciter)—instant bandswitching 80 through 10 meters! Compact RF unit designed for desk-top operation—power supply modulator unit may be placed in any convenient location. All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Operates by crystal control or highly stable, built-in VFO. Class C 4-400A final amplifier provides plate circuit efficiencies in excess of 70% with unequalled broadcast-type high level amplitude modulation. Wide range pi-network output circuit with silver-plated final tank coil will load virtually any antenna system. Low level audio clipping—effectively TVI suppressed and filtered. With tubes.

Cat No.	Amateur Net
240-500-1..Kit	$749.50
240-500-2..Wired	$949.50

VIKING "COURIER" AMPLIFIER
This power-packed Class B linear amplifier is rated 500 watts P.E.P. input with aux. SSB exciter—500 watts CW and 200 watts AM! Continuous coverage 3.5 to 30 mcs. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: 5 to 35 watts. Employs two 811A triodes in parallel—wide range pi-network. TVI suppressed. With tubes.

Cat. No.	Amateur Net
240-352-1..Kit	$244.50
240-352-2..Wired	$289.50





VIKING "RANGER" TRANSMITTER/EXCITER
Superbly engineered . . . delivers solid audio punch! This popular 75 watt CW or 65 watt phone transmitter also serves as an RF/audio exciter for high power equipment. Built-in VFO or crystal control—instant bandswitching 160 through 10 meters. 6146 final amplifier—wide range pi-network output. Timed sequence keying. TVI suppressed. With tubes, less crystals.

Cat. No. 240-161-1..Kit.....Amateur Net $229.50
Cat. No. 240-161-2..Wired and tested.....Amateur Net $329.50

VIKING "VALIANT" TRANSMITTER
Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) and 200 watts phone. Instant bandswitching 160 through 10 meters—built-in VFO or crystal control. Final amplifier utilizes three 6146 tubes in parallel—wide range pi-network output. Silver-plated final amplifier inductor—built-in low pass audio filter—low level audio clipping. With tubes, less crystals.

Cat. No. 240-104-1..Kit.....Amateur Net $349.50
Cat. No. 240-104-2..Wired and tested.....Amateur Net $439.50

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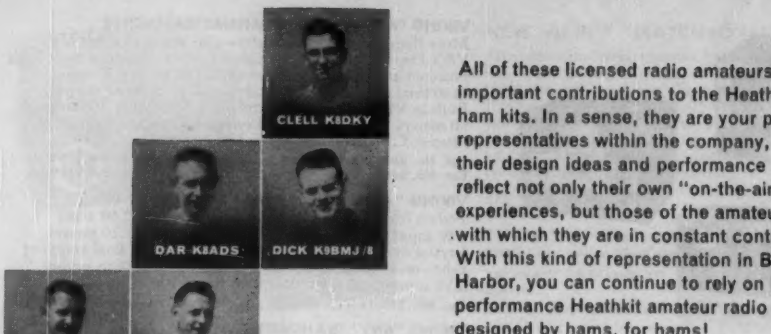


All of these licensed radio amateurs make important contributions to the Heath line of fine ham kits. In a sense, they are your personal representatives within the company, because their design ideas and performance preferences reflect not only their own "on-the-air" experiences, but those of the amateur fraternity with which they are in constant contact. With this kind of representation in Benton Harbor, you can continue to rely on high-performance Heathkit amateur radio equipment designed by hams, for hams!

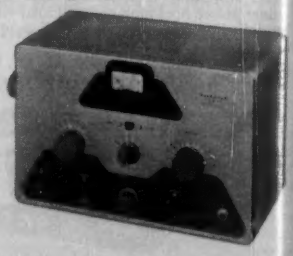
HEATH *hams work to bring you*

ROGER MACE (W8MWZ)
SENIOR HAM ENGINEER
HEATH COMPANY

HEATHKIT 50-WATT CW TRANSMITTER KIT

MODEL DX-20

$35.95



If high efficiency at low cost in a CW transmitter interests you, you should be using a DX-20! It employs a single 6DQ6A tube in the final Amplifier stage for plate power input of 50 watts. The oscillator stage is a 6CL6, and the rectifier is a 5U4GB. Single-knob band-switching is featured to cover 80, 40, 20, 15, 11 and 10 meters, and a pi network output circuit matches antenna impedances between 50 and 1000 ohms to reduce harmonic output. Designed for the novice as well as the advanced class CW operator. The transmitter is actually fun to build, even for a beginner, with complete step-by-step instructions and pictorial diagrams. All the parts are top-quality and well rated for their application. "Potted" transformers, copper-plated chassis, and ceramic switch insulation are typical. Mechanical and electrical construction is such that TVI problems are minimized. If you desire a good clean CW signal, this is the transmitter for you! Shpg. Wt. 19 lbs.

HEATHKIT "APACHE" HAM TRANSMITTER KIT

- Newly Designed VFO—Provision For S.S.B. Adapter
- Modern Styling—Rotating Slide Rule Dial

MODEL TX-1 **$229.50**

Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.

Fresh out of the Heath Company laboratories, the brand-new "Apache" model TX-1 Ham Transmitter features modern styling and is designed as a handsome companion to the also-new Heathkit "Mohawk" receiver. The "Apache" is a high quality transmitter operating with 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, the "Apache" features built-in switch selected circuitry providing for single-sideband transmission through the use of a plug-in external single-sideband adapter. These Heathkit adapters will be available in the near future. A compact, stable and completely redesigned VFO provides low drift frequency control necessary for single-sideband transmission. An easy-to-read slide rule type illuminated rotating VFO dial with vernier tuning provides ample band spread and precise frequency setting. Simple band-switching control allows flip-of-the-wrist selection of the amateur bands on 80, 40, 20, 15 and 10 meters (11 M with crystal control). The "Apache" features adjustable low level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL-34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely enclosed in a perforated aluminum shielding for greater TVI protection and transmitter stability. Cabinet comes completely preassembled with top hatch for convenient access without taking chassis out of cabinet. Die-cast aluminum knobs and front panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. Incorporates all the refinements necessary with many "plus" features for effective and dependable communications. Shpg. Wt. 115 lbs.

...top quality at lowest prices!

HEATHKIT "MOHAWK" HAM RECEIVER KIT

- All Critical Circuits Prewired and Aligned
- Crystal Controlled Oscillators for Drift-Free Reception

MODEL RX-1 **$274.95**

Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.

Outstanding results can be expected with the new "Mohawk" receiver which is designed to combine all the necessary functions required in a high quality communications receiver. A perfect companion for the Heathkit "Apache" transmitter, the "Mohawk" features the same wide-band slide rule type vernier tuning and covers all of the amateur bands from 160 through 10 meters on seven bands with an extra band calibrated to cover 6 and 2 meters using a converter. External receiver powered accommodations are available for these converters which will be available in Heathkits soon. The "Mohawk" is specially designed for single-sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled, wired and aligned front end assures ease of assembly. All critical wiring is done for you insuring top performance. This 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc. Five selectivity positions from 5 kc to 500 CPS. A bridged T-notch filter is employed for maximum heterodyne rejection. Complete accuracy is obtained with the use of a built-in 100 kc crystal calibrator and the set features 10 db signal-to-noise ratio at less than 1 microvolt input. S-meter and many other fine features built-in for top-notch signal reception. Shpg. Wt. 90 lbs.

HEATH COMPANY A Subsidiary of Daystrom, Inc. BENTON HARBOR 8, MICH.

HEATHKIT PHONE & CW TRANSMITTER KIT

MODEL DX-40 **$64.95**

The DX-40 incorporates the same high quality and stability as the DX-100, but is a lower powered rig for crystal operation, or for use with an external VFO. Plate power input is 75 watts on CW, permitting the novice to utilize maximum power. An efficient, control-carrier modulator for phone operation peaks up to 60-watts, so that the rig has tremendous appeal to the general class operator also. Single-knob switching covers 80, 40, 20, 15, 11 and 10 meters. Pi network output coupling makes for easy antenna loading, and pi network interstage coupling between the buffer and final amplifier improves stability and attenuates harmonics. A line filter is incorporated for power line isolation. The efficient oscillator and buffer circuits provide adequate drive to the 6146 final amplifier from 80 to 10 meters, even with an 80-meter crystal. A drive control adjustment is provided, and the function switch incorporates an extra "tune" position so that the buffer stage can be pretuned before the final is switched on. A switch selects any of three crystals, or a jack for external VFO. High quality D'Arsonval meter for tuning. Shpg. Wt. 26 lbs.

HEATHKIT DX-100 PHONE & CW TRANSMITTER KIT

MODEL DX-100 **$189.50**

Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.

You get more for your transmitter dollar when you decide on a DX-100 for your ham shack! Recognized as a leader in its power class, the DX-100 offers such features as a built-in VFO, built-in modulator, TVI suppression, pi network output coupling to match a variety of antenna impedances from 50 to 600 ohms, pi network interstage coupling, and high quality materials throughout. Copper plated 16-gauge steel chassis, ceramic switch contacts, etc., are typical of the kind of parts you get, in assembling this fine rig. The DX-100 covers 160, 80, 40, 20, 15, 11 and 10 meters with a single bandswitch, and with VFO or crystal operation on all bands. RF output is in excess of 100 watts on phone and 120 watts on CW, with a pair of 6146 tubes in parallel for the final amplifier, modulated by a pair of 1625 tubes in parallel. VFO tuning dial and panel meter are both illuminated for easy reading, even under subdued lighting conditions. Attractive front panel and case styling is completely functional, for operating convenience. Designed exclusively for easy step-by-step assembly. No other transmitter in this power class combines high quality and real economy so effectively. Here is a transmitter that you will be proud to own. Time payments are available! Shpg. Wt. 107 lbs.

more fine ham gear from the pioneer

HEATHKIT GRID DIP METER KIT

A Grid Dip Meter is basically an RF Oscillator used to determine the frequency of other Oscillators, or tuned circuits. Numerous other applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, designing new coils, etc. Features continuous frequency coverage from 2 MC to 250 MC, with a complete set of prewound coils, and a 500 ua panel meter. Has sensitivity control and a phone jack for listening to the "Zero-Beat". It will also double as an absorption-type wave meter. Shpg. Wt. 4 lbs.

MODEL GD-1B **$21.95**

Low frequency coil kit: two extra plug-in coils extend frequency coverage down to 350 KC.
Shpg. Wt. 1 lb. No. 341-A **$3.00**

HEATH COMPANY A subsidiary of Daystrom, Inc. BENTON HARBOR 9, MICHIGAN

HEATHKIT ALL-BAND COMMUNICATIONS-TYPE RECEIVER KIT

Ideal for the short wave listener or beginning amateur, this Receiver covers 550 KC through 30 MC in four bands. It provides good sensitivity and selectivity, combined with fine image rejection. Amateur bands are clearly marked on the illuminated dial scale. Features transformer type—power supply—electrical band spread—antenna trimmer—separate RF and AF gain controls—noise limiter—internal 5¼" speaker—head phone jack and AGC. Has built-in BFO for CW reception. An accessory power socket is also provided for connecting the Heathkit model QF-1 Q Multiplier. Will supply 250 VDC at 15 ma and 12.6 VAC at 300 ma. Shpg. Wt. 12 lbs.
Cabinet: Fabric covered cabinet with aluminum panel as shown part 91-15A. Shpg. Wt. 5 lbs. $4.95

MODEL AR-3
$29.95

HEATHKIT ELECTRONIC VOICE CONTROL KIT

Here is a new and exciting kit that will add greatly to your enjoyment in the ham shack. Allows you to switch from Receiver to Transmitter merely by talking into your microphone. Lets you operate "break-in" with an ordinary AM transmitter. A terminal strip is provided for Receiver and speaker connections and also for a 117 volt antenna relay. Unit is adjustable to all conditions by sensitivity and gain controls provided. Easy to build with complete instructions provided. Requires no transmitter or Receiver alterations to operate. Shpg. Wt. 5 lbs.

MODEL VX-1
$23.95

HEATHKIT "Q" MULTIPLIER KIT

This fine Q Multiplier is a worthwhile addition to any communications, or Broadcast Receiver. It provides additional selectivity for separating signals, or will reject one signal and eliminate a hetrodyne. Functions with any AM Receiver having an IF frequency between 450 and 460 KC that is not AC-DC type. Operates from your Receiver power supply, and requires only 6.3 VAC at 300 ma (or 12.6 VAC at 150 ma), and 150 to 250 VDC at 2 ma. Simple to connect with cable and plugs supplied. Effective Q of approximately 4000 for sharp "peak" or "null". A tremendous help on crowded phone or CW bands. Shpg. Wt. 3 lbs.

MODEL QF-1
$9.95

ALL-BAND RECEIVER

ELECTRONIC VOICE CONTROL

"Q" MULTIPLIER

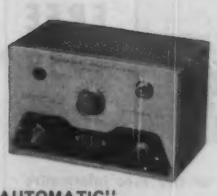
NOTE: $10.65 WHEN ORDERED WITH AR-3 BECAUSE OF EXCISE TAX.

...in do-it-yourself electronics!

HEATHKIT "AUTOMATIC" CONELRAD ALARM KIT

Designed to give instant warning whenever a monitored station goes off the air, the CA-1 automatically cuts the AC power to your transmitter, and lights a red indicator. Works with any radio receiver; AC-DC—transformer operated—battery powered, so long as the receiver has AVC. A manual "reset" button is provided to reactivate the transmitter. Incorporates a heavy-duty 6-ampere relay, a thyratron tube, and its own built-in power supply. A neon lamp shows that the alarm is working. Simple to install and connect with complete instructions provided for assembly and operation. Shpg. Wt. 4 lbs.

MODEL CA-1
$13.95



"AUTOMATIC" CONELRAD ALARM

HEATHKIT VARIABLE FREQUENCY OSCILLATOR KIT

Enjoy the convenience and flexibility of VFO operation by obtaining this fine variable frequency oscillator. It covers 160-80-40-20-15-11 and 10 meters with three basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Requires 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a, available on most transmitters. It features voltage regulation for frequency stability, and has illuminated frequency dial. VFO operation allows you to move out from under interference and select the portion of the band you want to use without having to be tied down to only 2 or 3 frequencies through the use of crystals. "Zero in" on the other fellows signal and return his CQ on his own frequency! Shpg. Wt. 7 lbs.

MODEL VF-1

$19.50

HEATHKIT REFLECTED POWER METER KIT

A necessity in every well equipped ham shack, the model AM-2 lets you check the match of the antenna transmission system, by measuring the forward and reflected power or standing wave ratio. Handles up to one kilowatt of energy on all bands from 160 to 2 meters, and may be left in the antenna system feed line at all times. Input and output impedances for 50 or 75 ohm lines. No external power required for operation. Meter indicates percentage forward and reflected power, and standing wave ratio from 1:1 to 6:1. Shpg. Wt. 3 lbs.

MODEL AM-2

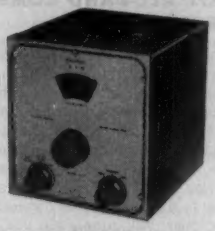
$15.95

HEATHKIT BALUN COIL KIT

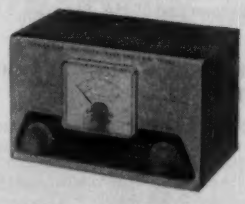
This convenient transmitter accessory has the capability of matching unbalanced coax lines, used on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance. Design of the bifilar wound Balun Coils will enable transmitters with unbalanced output to operate into balanced transmission line, such as used with dipoles, folded dipoles or any balanced antenna system. Can be used with transmitters and Receivers without adjustment over the frequency range of 80 through 10 meters. Will handle power inputs up to 200 watts. Shpg. Wt. 4 lbs.

MODEL B-1

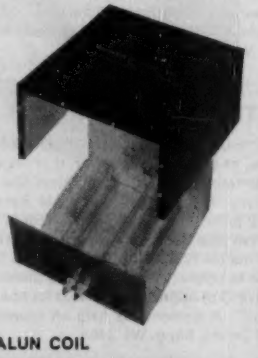
$8.95



VARIABLE FREQUENCY OSCILLATOR



REFLECTED POWER METER



BALUN COIL

save ½ or more . . . with HEATHKITS

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Send for this Free informative catalog listing our entire line of kits, with complete schematics and specifications.

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HEATH COMPANY

BENTON HARBOR 9, MICH. a subsidiary of Daystrom, Inc.

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QUAN.	ITEM	MODEL NO.	PRICE

$_____enclosed. Parcel post, include postage—express orders are sent shipping charges collect. All prices quoted are Net F.O.B. Benton Harbor, Mich. and apply to Continental U.S. and Possessions only. All prices and specifications subject to change without notice.

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service to industry with these products for 25 years

- COMMUNICATION ANTENNA SYSTEMS
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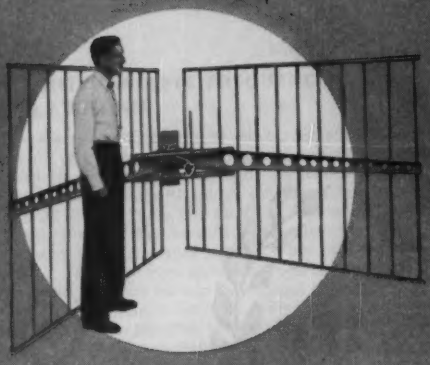
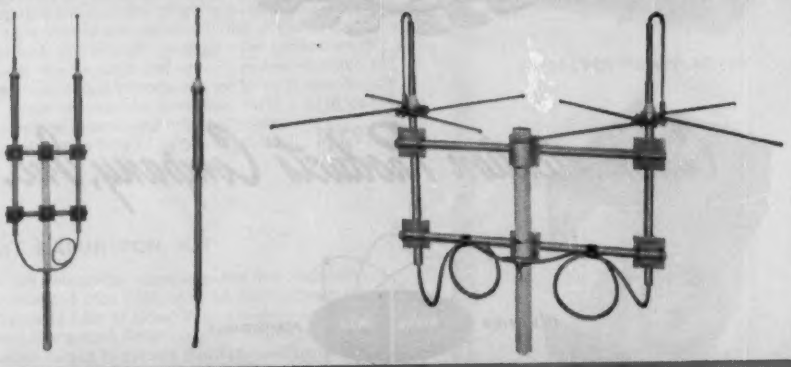
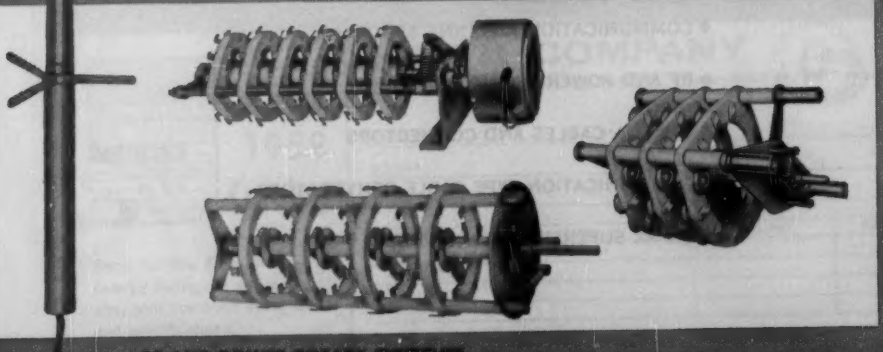
- COMMUNICATION TYPE CABLE DEHYDRATORS
- Q-MAX SUPERFINE RF LACQUER



25th



COMMUNICATION ANTENNAS



RF AND POWER ROTARY SWITCHES

CERTIFIED SINCE 1933 PERFORMANCE

Anniversary

COAXIAL CABLE
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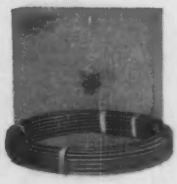
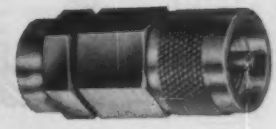
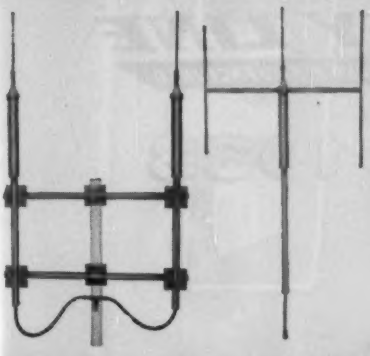


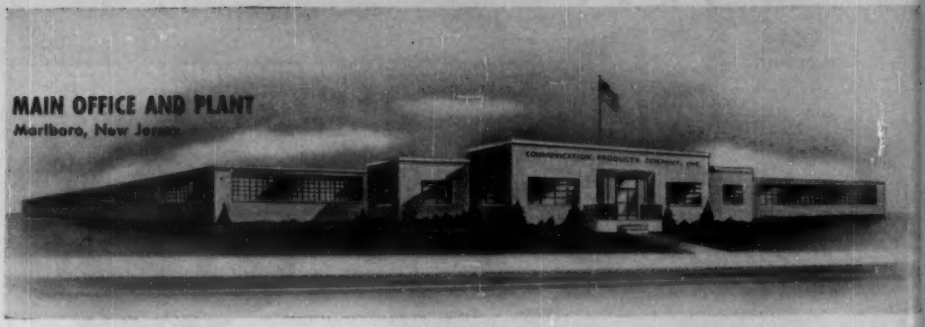




Q-MAX SUPERFINE
RF LACQUER

COMMUNICATION
TYPE CABLE
DEHYDRATORS

COMMUNICATION PRODUCTS CO., INC.



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- General coverage—540 KCS to 30.0 MCS in four bands. Electrical bandspread on all ham bands within frequency range of receiver.
- Dual conversion from 10.0 to 30.0 MCS.
- Unique combination of adjustable 60 db slot filter and six-position selective crystal filter for endless tuning techniques.
- 11-tube superheterodyne with improved, automatic noise limiter.
- 0.5 microvolt sensitivity on CW with 10:1 signal-to-noise ratio.
- Hammarlund quality design and construction throughout.
- Optional plug-in type 100 KCS crystal calibrator.

take a good look!

THIS IS THE NEW HQ-145

$269.00 amateur net

Telechron Clock-timer, optional, $10 extra

Plug-in 100 KCS crystal calibrator, $15.95 extra.

GET COMPLETE DETAILS. WRITE FOR HQ-145 BROCHURE...

HAMMARLUND

HAMMARLUND MANUFACTURING COMPANY, INC.
460 West 34th Street, New York 1, New York

Take a good long look at the features offered in this newest Hammarlund receiver. Never before has so much been offered in a general-coverage receiver at such a low price. The all-new HQ-145 is another winner in the ever-growing line of quality Hammarlund receivers—whatever your needs and budget, you'll find your best buy is a Hammarlund!

Established 1910

GOTHAM ON ANTENNAS • • • • • • • SOME QUESTIONS AND ANSWERS

As one of the oldest antenna manufacturers consistently advertising in *QST*, we think it is a good idea to sum up our activities, comment on the antenna industry, and answer questions that arise year after year.

We have seen scores of antenna manufacturers come along with new designs, run an ad or two, perhaps linger longer, then disappear. Almost always the pattern ran: A new super antenna that could be made for pennies was advertised at fantastically high prices, accompanied by fantastic blurbs for its performance. A few antennas would be sold, and the manufacturer would sadly discover that only antennas that had stood the test of time could sell in sufficient quantities to cover all costs. As a result of these scores of failures, 'orphan' antennas still pop up plaintively in 'Used Equipment' bargain columns.

From the moment Gotham made its first antenna, there has always been continued acceptance of Gotham antennas as the standard of the amateur radio field. We are very proud of the fact that every one of our beams is a full half-wave in element size, justifying the hams' faith in our basic design.

To sum up our present plans, Gotham will continue to manufacture fifty ham antennas at low, low prices. Our only new venture for the foreseeable future is a new low-cost marine radio-telephone antenna, which will bring an added measure of safety to mariners, due to a new efficient design. Literature is available.

And now to answer some questions: Why is the Gotham price so very low? Doesn't the low price mean a lack of quality? Answer: The Gotham price is low because we sell in quantities and make only a fair profit on each antenna. We do not add on a tremendous overhead and engineering charge. As for quality, we have always used the best materials, and every antenna is doubly inspected before shipment. Thousands of Gotham antennas are in use the world over.

Why are all Gotham beams of the Yagi type, all metal, and grounded at the center? Answer: To get the maximum strength for the minimum weight, to get maximum efficiency, and to avoid the use of wood, tuning stubs, traps, or other substitute devices, all of which are undesirable and unnecessary. In addition, grounded beams are lightning-proof and protect your home.

How do Gotham beams gain compare with higher priced antennas? Answer: No beam, regardless of price, can give more gain, for a given boom size, than a Gotham beam. Obviously, the more elements, the more gain. Our gain figures are published in our literature, and are available, free, on request.

What matching systems are available in Gotham beams? Answer: We use both the Gamma match for 52 and 72 ohm coaxial feed, and the T match for 300 ohm feed. These are tried and true matching systems, proven by thousands of hams, and extremely simple. No electronic equipment or measuring devices are needed. Everything is furnished.

How difficult is it to put a Gotham beam together? Answer: It's easy, and it takes only a few moments. No special tools are required for assembly and installation. Full, simple instructions are given, and all machining and cutting is done at the factory. Thousands of novices have successfully assembled and installed our antennas.

What is the difference between the Standard and the DeLuxe beams? Answer: The Standard beams in the 6, 10, and 15 meter bands used $\frac{5}{8}$" and $\frac{3}{4}$" tubing elements; the DeLuxe models for these bands use $\frac{7}{8}$" and 1" tubing. In the 20 meter beams, the Standard beams have a single boom, while the DeLuxe beams use twin booms. All 20 meter beams use full 12 foot booms. In the 20 meter beams and in the Twobanders and Tribanders, only $\frac{7}{8}$" and 1" tubing are used.

Is the Gotham aluminum tubing corrosion-proof? Is is strong? Answer: Yes, our aluminum has an 'aluminized' finish, both on the inside and outside surfaces, and is corrosion-proof. As for strength, our 6063T832 alloy has a yield strength of 40,000 lbs/sq. in.

Is it advantageous to use a Gotham Twobander or Tribander beam? Answer: Hundreds of these beams are in daily use. They are compromise beams, but by having each element a full half-wave, their gain figures are more than reasonably good. Of course a single three element beam on a single band will outperform a Tribander on that band, but the Tribander permits beam operation on three bands.

Are Gotham beams complete? Answer: Yes, we furnish everything — all tubing, fittings, castings where required, instructions — nothing extra to buy. We do not price an antenna piecemeal.

Do any Gotham antennas require guying? Answer: No. Our antennas have been designed to be self-supporting, due to the combination of tremendous strength and light weight. Whereas thin-walled or trapped verticals must be guyed, our 23 foot vertical antenna has come through hurricane winds without damage.

Do the Gotham verticals perform well on all bands? Answer: Yes, thousands of ham users attest to their efficiency on all bands from 6 to 160 meters. Reports of tremendous DX on low power are common.

Are mounts supplied with the vertical antenna? Answer: Yes, four mounting straps for side mounting are furnished with each vertical.

Are radials needed with a Gotham vertical? Answer: No, except in a few rare locations. 99% of the installations are done without radials.

Must a vertical antenna be mounted at any particular height? Answer: No, any convenient height will do. The higher, the better.

How do you change bands on a Gotham vertical? Answer: For 20, 15, 10, and 6 meters, the loading coil is not used. For 40, 80, and 160 meters, the proper portion of the loading coil is used.

Do you need a separate loading coil for each band? Answer: No, a V160 loading coil will cover 160, 80, 40, 20, 15, 10 and 6; a V80 loading coil will cover 80, 40, 20, 15, 10, and 6; a V40 loading coil will cover 40, 20, 15, 10, and 6 meters.

How much power can be used with a Gotham vertical? Answer: Anything up to the legal limit.

Is much space required for installing a vertical? Answer: No, only a few square inches are needed.

Can you give details on the loading coil used in the Gotham verticals? Answer: Yes, it is made for us by Barker and Williamson. It is 3" in diameter and exceptionally rugged. No other loading coil in the antenna industry has a higher Q.

Which do you recommend buying, a vertical or a beam? Answer: A beam is always preferable for use on any particular band. The beam cuts down QRM and amplifies the transmitted and received signal. The vertical has the advantages of small space, low cost, no rotator required, and multi-band coverage.

Why does Gotham make so many different antennas? Answer: To meet the needs of hams everywhere for a wide variety of antennas, on all bands.

What antennas are best for a novice? Answer: The V80 vertical and the S153N beam are the most popular choices.

Why should a ham buy a Gotham antenna? Answer: The tremendous progress of the amateur radio art makes it imperative that hams graduate from the antiquated antennas of years past to a modern antenna system. We will be glad to send, free of charge, our technical literature on our 50 antennas, or you can order for immediate shipment.

73,
GOTHAM

10% PRICE SLASH!

TAKE 10% OFF WHEN ORDERING

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST

1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6–10 TWO BANDER.....	☐	$29.95
10–15 TWO BANDER.....	☐	34.95
10–20 TWO BANDER.....	☐	36.95
15–20 TWO BANDER.....	☐	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

☐ 6-10-15 $39.95 ☐ 10-15-20 $49.95

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

☐ Deluxe 6-Element 9.95 ☐ 12-El 16.95

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

☐ Std. 3-El Gamma match	12.95	☐ T match	14.95
☐ Deluxe 3-El Gamma match	21.95	☐ T match	24.95
☐ Std. 4-El Gamma match	16.95	☐ T match	19.95
☐ Deluxe 4-El Gamma match	25.95	☐ T match	28.95

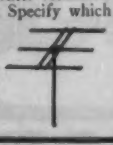
10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30–50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

☐ Std. 2-El Gamma match	11.95	☐ T match	14.95
☐ Deluxe 2-El Gamma match	18.95	☐ T match	21.95
☐ Std. 3-El Gamma match	16.95	☐ T match	18.95
☐ Deluxe 3-El Gamma match	22.95	☐ T match	25.95
☐ Std. 4-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 4-El Gamma match	27.95	☐ T match	30.95

Newl Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.



☐ Beam #R6 (6 Meters, 4-El)....$38.95
☐ Beam #R10 (10 Meters, 4-El).. 40.95
☐ Beam #R15 (15 Meters, 3-El).. 49.95

15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

15 METER BEAMS

☐ Std. 2-El Gamma match	19.95	☐ T match	22.95
☐ Deluxe 2-El Gamma match	29.95	☐ T match	32.95
☐ Std. 3-El Gamma match	26.95	☐ T match	29.95
☐ Deluxe 3-El Gamma match	36.95	☐ T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

☐ Std. 2-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 2-El Gamma match	31.95	☐ T match	34.95
☐ Std. 3-El Gamma match	34.95	☐ T match	37.95
☐ Deluxe 3-El Gamma match	46.95	☐ T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

You could work the whole world, and get fantastic reports, with a Gotham vertical and only 55 watts, like VP1SD.

You could work tremendous skip and DX, and be surprised at the way your Gotham vertical brings them in, as R. E. C. of Washington, D. C., found out.

You could have a simple, easy-to-install-and-operate vertical antenna, and switch from band to band, as thousands of Gotham customers have done.

☐ **V40 vertical for 40, 20, 15, 10, 6 meters. $14.95**

☐ **V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters.....$16.95**

☐ **V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters.....$18.95**

HOW TO ORDER. Send check or money order directly to Gotham or visit your local distributor. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

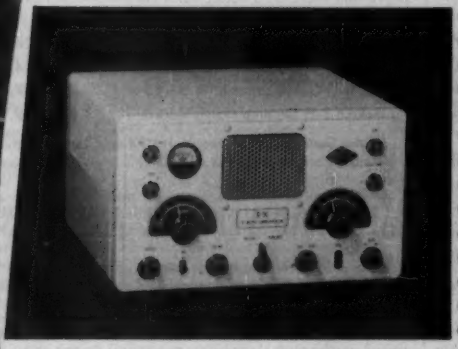
Address.....

City.....Zone.....State.....

Gonset's feature-packed equipment . . .

Two wonderful Christmas "packages"

The man who takes the wrapping off either of these two handsome fixed station packages Christmas morning is going to be happy indeed. Either "package" offers the sure, inexpensive means for putting a signal with real authority on its respective band. Bear in mind, everything's in one compact cabinet: 50 watt transmitter with pi net-work and calibrated VFO (or optional crystal) . . . sensitive, selective communications receiver . . . AC power supply. All elements are completely integrated, operate perfectly together. "Packaging" eliminates extra cost of several individual units, gives excellent performance . . . exceptional value.



6 METER FIXED-STATION COMMUNICATOR

- Coverage, 50-54 megacycles
- Complete 6 meter station...50 watts input...
- Type 6146 tube with pi network output...
- Stable, calibrated VFO with spotting switch to aid tuning. Optional xtal control...
- Highly selective, sensitive receiver...
- Adjustable squelch...noise limiter... "S" meter, panel mounted speaker...
- Heavy-duty 115V AC power supply built-in
- Case is attractive Alpine White with knobs in Gunmetal Blue.

No. 3221 ..... 319.50

10 METER FIXED-STATION COMMUNICATOR

- Coverage 28-29.7 megacycles.
- Complete 10 meter station...50 watts input...
- Type 6146 tube with pi network output...
- Stable, calibrated VFO with spotting switch to aid tuning. Optional xtal control...
- Highly selective, sensitive receiver...
- Adjustable squelch...noise limiter... "S" meter, panel mounted speaker...
- Built-in heavy duty 115V AC power supply
- Case is attractive Alpine White with knobs in Gunmetal Blue.

No. 3204 ..... 299.50

"THIN-PACK" 12V DC POWER SUPPLY FOR G-66A RECEIVER

"Thin pack" power supplies for G-66A receivers offer considerable monetary savings over the standard 3-way supply. Saves space too. Plugs into rear of G-66B and when so arranged, extends the overall case length by only 2½". Speaker is not included. 12V DC only.

See special "Thin-pack/G-66A" offer on next page.

GONSET

BURBANK, CALIF. DIVISION OF YOUNG SPRING & WIRE CORPORATION OF YO

. . . for a more memorable Christmas

Mobile "must" for anyone's Christmas list!

Peek over any mobile man's shoulder at the list of things he would like most for Christmas. Chances are excellent that the list will include one or more items of the feature-packed Gonset line of mobile and fixed communications equipment. This can be the Christmas you join other happy owners of Gonset's "Twin Sparklers", G-66B receiver and the G-77A transmitter, the ideal combination for mobile. *Now is indeed the time* . . . because a special Gonset Holiday Offer gives extra stretch to those Christmas dollars. (See details at bottom of page.)

G-66B RECEIVER

6 BANDS: 540-2000 kcs. 3500-4000 kcs. 7000-7300 kcs. 14,000-14,350 kcs. 21,000-21,450 kcs. 28,000-29,700 kcs.

AM, CW, SSB RECEPTION: Highly stabilized HF and BF oscillators and crystal controlled second conversion oscillator.

STEEP SKIRT SELECTIVITY: 265 kc 2nd I-F. 8-high Q tuned circuits, 3.5 kc I-F bandwidth at 6 db down.

DOUBLE CONVERSION ALL BANDS: 2050 kc 1st I-F. Double input tuning, (3 tuned circuits) on high bands for high image rejection.

AVC—Noise limiter—Panel S meter—antenna trimmer—BFO Pitch—Audio/RF gain control—slide rule dial—3 watts audio.

G-77A TRANSMITTER

FREQUENCY RANGE: 80-40-20-15-10 meters. VFO or xtal, switchable. Highly stable VFO, each band spread over most of slide rule dial.

FULL BANDSWITCHING: Exciter ganged with VFO. Pi network output.

POWER INPUT: 50-60 watts, modulated. CW provisions. 6146 tube in output. New modulator has integral speech clipping. High gain speech permits PA-type dynamic, reluctance or crystal mikes.

POWER SUPPLY: Heavy-duty vibrator, 6V/12V DC. Also 115V AC. Output voltage 500-600V full load. Selenium rectifier. Low drain on standby and transmit. Power supply/modulator is separate unit.

Special Holiday Offer

G-66B receiver, less power supply and speaker #3046 ..... 209.50
"Thin-pack" 12 V DC power supply for G-66A #3098 .... 29.50
G-77A transmitter with universal power supply for 6/12 volts DC and 115 volts AC #3203 ..... 299.00

Total . . . Regular price 538.00

SPECIAL HOLIDAY OFFER **499.00**

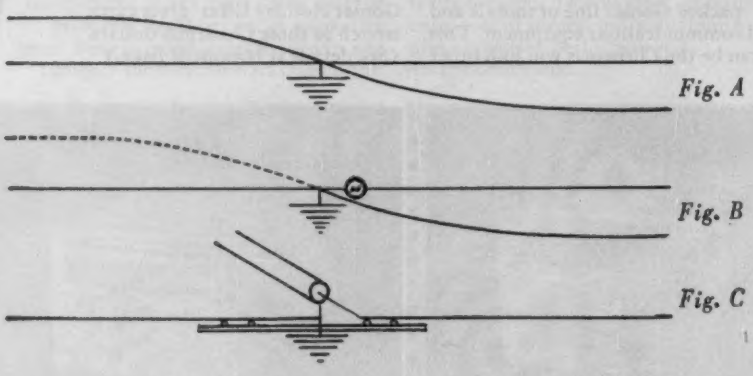
GONSET

DIVISION OF YOUNG SPRING & WIRE CORPORATION BURBANK, CALIF.

A DISCUSSION OF BEAM ANTENNA FEED SYSTEMS

Among those Hams interested in beam antennas, many are concerned with the feed systems employed. It is for these Hams that we shall attempt to explain the wonderfully simple—yet highly efficient—feed system used in both the *Trap Master* and the *Power Master* series of MOSLEY beam antennas.

The beliefs that a balanced radiator element cannot be fed with an unbalanced line and that the impedance at the center of the element is not of a suitable value to permit direct connection of a 52 ohm coax line are not always correct. We will show, with authoritative references, that antennas *can* be designed to take advantage of the simplicity of such a system and still provide low VSWR over a broad bandwidth and a symmetrical radiation pattern. Page numbers will refer to the ARRL Antenna Book, seventh edition.



The voltage distribution over a half-wave radiator is shown in *Fig. A*. Since voltage is *zero* at the center, a ground may be placed at this point. *(Page 26)*

There are a variety of methods for introducing energy into the antenna. A balanced line may be connected directly to suitable points at each side of the grounded element center—a method commonly called the *delta* match or, with slight modification, *T* match. To connect an unbalanced line to a grounded un-split element, the *gamma* match from grounded center to a suitable point at one side of center may be used.

However, the element may be split at the center and fed with either a balanced line without a ground at the center or an unbalanced line with or without a ground at at the center. With an unbalanced line and ground on *both* the outer conductor (coax braid) and antenna center, a voltage introduced just off center in the position of the power source (*Fig. B.*) will introduce a voltage in this excited side, as shown. With the other half of the antenna element an integral part of the circuit, voltage will appear as indicated by the dotted line. Since the end of the feed line is fundamentally the same as a power source it may be replaced in the circuit, (*Fig. C.*), resulting in a balanced antenna fed with an unbalanced line. The ground at the center helps to minimize stray feed line currents to achieve the balanced pattern.(*Further information on feeding balanced antennas with coax line can be found on pages 98-100*) (*See, also, page 224, Fig. 10-10*).

Curves on *page 169, Fig. 4-51,* show how a three element beam, by correct tuning and element spacing, may present a feed point impedance of from 10 to 70 ohms. Of course, MOSLEY beams are tuned and spaced to present 52 ohms at suitable tuning points with low VSWR over the entire bands of operation and to achieve proper voltage distribution for a balanced radiation pattern.

MOSLEY ELECTRONICS, Inc. • St. Louis 14, Missouri
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THE BIG-SIGNAL ANTENNA

Here's the full-size beam with full-size performance, for the ham who demands the best!

100% rust-proof . . . aluminum elements and boom . . . stainless steel hardware . . . high impact polystyrene insulators . . . all the finest . . . all built to last!

Each POWERMASTER is designed for a single band . . . 10, 15 or 20 meters . . . with low SWR over entire bandwidth.

For U.S.A. only

A-310 — 3 elements, 10M, rated 1KW.....$37.50
A-315 — 3 elements, 15M, rated 1KW.....$42.50
A-320 — 3 elements, 20M, rated 1KW.....$77.25

If your dealer can't supply the POWERMASTER you want, write to

If You're a "Tribander," Be Sure and See the Mosley TRAPMASTER Line

Mosley Electronics, Inc.

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St. Louis 14, Mo.

Win a free Prize!

Over $1500 in prizes to be given away by TAPETONE, INC., Webster, Mass.

There has been a rapid growth of radio amateur 6 meter (50 mc band) activity. There are more TV stations with better antennas and operating with higher power. Other VHF communication services and man-made noise of various kinds has increased. **All this** has created **serious problems** of **receiver overloading** more so in city areas not considered in years gone by. Tapetone is vitally interested in this **receiver design problem.** To have more **facts** and **information** of these interference conditions and **without regard to technical solution,** **Tapetone offers these prizes for:**

The best description of interference conditions encountered in 50 mc reception. The judges will be guided by the most complete factual, accurate and informative entry describing these interference conditions.*

*Although technical solutions may be interesting and might later be published with proper credit to the writer, the judges will not give additional credit or be guided by these suggested technical solutions.

1ST PRIZE — TAPETONE'S NEW "SKY SWEEP" 6 METER RECEIVER.

2ND PRIZE — TAPETONE'S NEW "SKY HAWK" 6 METER TRANSMITTER.

TEN 3RD PRIZES — YOUR CHOICE OF TAPETONE'S 1¼ METER, 2 METER OR 6 METER CONVERTERS.

PLUS — 100 HONORABLE MENTION GIFT CERTIFICATES VALUED AT $5.00 EACH.

JUDGES:

A. A. FARRAR, W1CLS, Asst. Vice Pres., Raytheon Mfg. Company

A. E. COE, W1RVQ, Radio Shack, Boston.

E. C. HARRINGTON, W1JEL, Pres. Harrington Electronics

T. W. LANMAN, Pres. Tapetone, Inc.

RULES:

1. All entries must be mailed to TAPETONE, INC., 10 Ardlock Place, Webster, Massachusetts, complete with entrant's name, address and call letters clearly indicated.
2. All entries must be postmarked before January 15, 1959 and received before midnight January 29, 1959.
3. Each entry will be judged on the basis of clarity, facts, and completeness. The judges' decision will be final.
4. Only one prize will be awarded to a person. All entries become the property of TAPETONE, INC., to use as it sees fit, and none will be returned.
5. This contest is subject to all Federal, State and local regulations.
6. All winners will be notified by mail by February 28, 1959 and a list of winners will appear in April QST.

Due to the response we have received on this contest, we are extending the contest to January 15, 1959. All entries must be received before midnight January 29, 1959.

TAPETONE, INC. 10 ARDLOCK PLACE, WEBSTER, MASS.

TAPETONE'S NEW

Sky Sweep....

Model 345
Price **$279.95**

Single Conversion | **High Frequency IF.** | **Crystal Lattice Filter** | **No Secondary Image**

Tapetone, specialists in frequency conversions, now brings to the air waves an amazing, new six-meter receiver that will give you consistent top performance.

● **RECEIVER FEATURES:**

- ★ Noise figure less than 3.6 db (0.5MV signal produces 10 db signal to noise).
- ★ Long linear slide rule dial with smooth inertia tuning.
- ★ Dial calibrated for 6, 2, 1¼ and ¾ meter bands.
- ★ Power available from receiver for future companion 2, 1¼ and ¾ meter converters.
- ★ Cascode RF amplifier.
- ★ Linear detector for SSB and CW with AVC on or off.
- ★ Coverage — 49.0 — 54.0 mc.

● **CRYSTAL LATTICE FILTER ACHIEVES THESE FEATURES:**

- ★ Band width at 6 db: 3.5 KC.
- ★ Band width at 60 db: 12.5 KC.
- ★ Band pass flat to ±½ db for 3.0 KC. band width.
- ★ Image rejection 60 db down.
- ★ Rejection of all other spurious and unwanted signals 70 db down.

We are specialists in frequency converters.
We offer over 30 different models.
Write for descriptive literature on all units.

TAPETONE, INC. 10 ARDLOCK PLACE, WEBSTER, MASS

Station Activities

(Continued from page 110)

OBSs; K2RTN, K2QDT and K2EE as OPSs; K2MES as ORS. Endorsements: W2MTA as OBS; W2CXM and W2COB as OPSs. K2QPC is building an 829B rig for 6 meters. K2HUK is building a G-G 304TL linear for s.s.b. NYSPTEN NCS stations are K2BWK, K2RTN, K2MES, K2KJZ, K2KQC, W2PGA and W2ZDL. W2PVI is going RTTY. Congrats to W2COB on being high phone scorer in W.N.Y. and 2nd in New York State in the last CD Party. K2RAA and W2CTA constructed 2-meter transceivers. K2JFV has a new Thunderbolt and 100 countries on s.s.b. K2YJN now has 50 countries on 15 meters. W2QQ has retired the old rig and now drives a Courier with a DX-40. K2UZJ worked 14 countries in 2 weeks with 30 watts and a new beam. K2RYH has been appointed Second Regional Net manager. K2RWV has a new Valiant. K2IQH, from Sherbourne, is now signing KA2KS. Look for him on 10, 15 and 20 meters every day. K2PEY has used a transisterized rig on 6 meters with excellent results. The Syracuse V.H.F. Club put on the program at the Sept. RAGS meeting. Subject? V.H.F. Have you joined the AREC? In registering your station facilities and your availability as an operator with the Amateur Radio Emergency Corps you are not obligating yourself financially or legally. You are merely indicating that your skill and station equipment are available to your community and country if needed, and that to this end you are willing to participate in organizational preparedness as part of a local and national amateur group. Contact your EC, SEC or SCM for further details. K2IBS is mobile with the Gonset Twins. Other new mobilers include K2VCH, K2RQN and K2RDY. New officers of the Cornell ARC are K2OGG, pres.; K2CSD, vice-pres.; WN2TBF, secy.; KN2MIM, treas.; K2DEM, comm. mgr. Traffic: K2SIL 568, W2QDT 291, W2RUF 264, K2RYH 249, W2ATC 216, K2MES 156, K2IYP 132, K2GWN 130, K2KQC 96, W2YIY 62, K2AOQ 55, W2OE 51, W2PGA 49, K2UZJ 49, K2QHR 44, K2JBX 37, K2JDD 37, K2RWV 36, W2COB 32, W2PVI 32, W2TPV 28, W2FEB 21, K2RIT 15, K2HUK 12, W2RUT 12, K2BCL 11, K2TPB 11, W2GSJ 8, K2RTN 7, K2OBU 6, W2GBX 4, K2YJN 3, W2CXM 1, W2EMW 1.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: GJY, GEG and NUG. PAMs: AER and TOC. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. Certificate No. 2 for working all Pennsylvania counties (WAPC) goes to QHH. Congratulations. YOU and ZBY demonstrated ham radio to children at the D. T. Watson Home for Crippled Children, Leetsdale. BZR is attending school at Penn. State. ZKB has received D.U.F. certificate No. 3. CA now owns a Johnson Thunderbolt. K3AJB now has made WAS. LSS has a new Globe Champ. SIJ shows great prowess as a golfer, winning third place in the Dapper Dan Tourney. K3DEJ and K3BDI received Conditional Class licenses. UEM is convalescing from an illness. BJZ is overseas in England with the U. S. Air Force. GJY is the activities coordinator for the Baltimore and Ohio R. R. Amateur Radio Club. The AKARA, through *QRN*, reports that WGH has 220-Mc. DXCC now; the Westinghouse Research hams are forming a 6-meter net called Sparks; K3BWW gave an interesting talk on his elaborate TV camera and monitor set-up; SWV is looking forward to getting his AAA award. Up Erie way: BBO is stationed on a radar picket island in the Atlantic; STK and KNQ head up the code and theory classes at RAE; ZNY and BPB are attending Case Institute at Cleveland; K3AX8 has a new 10- and 6-meter beam up. The Etna RC reports through the *Oscillator* that EDK now has WAS; K3AWU has a new Apache rig; TOC has a new 10-meter beam and pole up; NUG was guest speaker at the Etna RC meeting; SIR has been under the weather. Steel City RC reports, through *Kilo Watt Harmonics*, that new officers are APN, pres.; ZPZ, vice-pres.; ZDW, treas.; JQJ, rec. secy.; MPK, corr. secy.; 8VJ is stationed in Germany; NKM now has 100 countries confirmed on s.s.b. K8I has a Mosley Tribander. 8XH has been appointed c.d. director at Donora. Traffic: W3LXU 298, UGV 32, LSS 24, GJY 22, BZR 18, WRE 9, LOD 2, KBZ 1, UHN 1.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: HOA. RM: PCQ. PAM: RYU. EC Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. K9IXK made WAS. K9JIN is back on the air after a sick spell and is sporting a new 80-meter antenna. WBE is back at his home QTH after a summer operating on the 88 *North America* with the call WTBA. JJN has his narrow-band lattice-sweeping equipment working real FB. K9ISP scored high in the latest VE/W Contest. New calls heard in Chicagoland are K9s OED, PDT, KN9s OXW, OZM and KL7BUU/M9. K9ERH's favorite subject is now Russian after receiving all those U DX QSL cards. K9MHW's winter project is the completion of a crystal-filter s.s.b. rig. MAK reports that the ILN handled 184 messages in 28 sessions and CSW and his North Central Phone Net completed 464 pieces of traffic. PCQ has now taken over the RM job and is giving MAK a much-deserved rest and more time for his studies. NIU enjoyed the APCO Convention in Baltimore. K9GUA has all the bugs out of his Apache and it is working 100 per cent with FB QSOs. The Peoria Hamfest was well attended and the gang had many an eyeball QSO. DRN is keeping schedules in the Chicago Area on 432 Mc. with a new section added to his tower. New radio club officers in the Rock Island Area are RYU, pres.; UCZ, vice-pres.; and K9EUF and DCV, secy. and treas.; with AKE, OWN and K9IDN, directors. EC VWJ is now mobile with a 147.3-Mc. f.m. rig. BON's new home-brew receiver for single sideband with a product detector is proving successful with DX signals. NN informs us that 86 DXCC members were present at the recent dinner in Chicago. SXL's XYL won a 6-meter converter as did LMS's XYL at the recent Peoria Area Radio Club's outing. 1KR is now on 6 meters. GDI received his WAZ and also now has 200 countries confirmed. Hamfesters (Chicago) is again putting on a spree for s.s.b. building. A new OO appointee is K9HCP, Governor Stratton and Generals Homer and Woodward spoke at the opening of the new c.d. control center at Wheaton on Oct. 19. K9OSN has a new Valiant and is doing well with it. K9KWB finally received his Globe Chief transmitter. BA, EC of St. Clair County, has been transferred to a Biloxi AFB and will be missed by the Southern Illinois gang, especially those in the c.d. group which was spearheaded by him. Good luck, Tom. OHK, TCX, DIB and BAE were also in his group that left the area. K9AHY has a much-improved 6-meter signal with his new 75-ft. tower and Long John with a motor-driven gamma match. EU returned from Colorado and maintained daily contacts with JID. He recently made WAZ. K9IXA is now a General with his head in the clouds. GME won an award at the National Convention for her novel skirt designed especially for the affair. TPA's new quad is getting fine results. PNV spoke at the Chicago Suburban Radio Assn. meeting on "Cubical Quad Antennas." ORH has added his Courier to his Pacemaker and is now going to town on all bands. Traffic: W9DO 774, K9GDQ 435, W9PCQ 180, FAW 172, MAK 131, K9ERH 127, MHW 100, ISP 45, W9IDA 44, JJN 39, RYL 18, WBE 15, CSW 12, K9JIN 10, W9PHE 7, K9IXK 4, BIV 2, KWB 2, W9TZN 2.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA. PAMs: BKJ, KOY, SWD and UXK. RMs: DGA and TT. The nets have changed to CST. IFN meets daily at 0800 and M-F at 1800 on 3910 kc. QIN meets daily at 1900 on 3656 kc. RFN meets Sun. at 0700 on 3656 kc. CMT and JOZ have resigned as SEC and RM, respectively, because of increased demands of their business. I want to thank both of these men for their help during the past year. SNQ, our new SEC, is active in the nets and has been doing a fine job as EC for Jay County. VAY, now RM for QIN, has been very active on the c.w. nets for several years. Both of these men are going to need your support to do the kind of a job they would like to. K9BSU has been appointed ORS. The new officers of the Naval Avionics ARC are Comm. John Cassidy, pres.; John Meeks, vice-pres. and K9HPX, secy.-treas. BDG has moved to South Bend. K9ELE reports KRN and MRL as new Cond. Cl. licensees in Winslow. K9AYI has received his WAS certificate. K9CWG has moved to Kokomo. We need a new EC for Jefferson Co. as QOT is now K7ES8 in Arizona. K9AUE is getting out well with a new 280-ft.-long wire. RTH reports K9DZS as a new Tech. Cl. licensee at Seymour. RE has gone s.s.b. with a new HT-32. The S.S.B. Net should be well organized by the time this is printed. Check with KOY or MEK for details. SWD reports evening IFN traffic as 244 and morning 79 for a total of 323. QIN traffic reported by JOZ was 194. TT reports a traffic count of 58 for RFN. Those making BPL were K9CLU, W9NZZ and VAY. Traffic: (Sept.) W9NZZ 818, VAY 666, K9CLU 443, GBB 273, W9JOZ 128, ETM 104, ZYK 98, TT 97, SWD 79, TOC 76, SNQ 75, K9AYI 63, W9EHZ 59, RTH 47, UOP 45, K9HGF 40, W9GJS 33, K9IXD 33, W9BKJ 26, EJW 26, WID 26, BUQ 25, FJR 25, K8JKK 19, W9DOK 18, CC 16, K9ELE 16, W9IMT 16, MHP 16, YYX 15, K9HIO 14, W9BDP 13, K9BSU 13, W9IHG 13, WAU 13, K9GFQ 12, W9WRK 11, BDG 10, IMU 10, MMY 9, K9GSV 8, LEJ 8, W9LIT 8, DDT 7, DZC 7, DGA 5, K9DWK 5, W9HUF 4, QR 3, VQP 3, DKR 2, K9NBK 2, W9NTA 2, K9AUE 1. (Aug.) W9OWI 14, NOG 4.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH. PAM: NRP. RMs: SAA, K9AEQ and K9ELT. CXY received his 35th BPL certificate. RKP

(Continued on page 136)

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E-Z WAY TOWERS, INC.

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Tampa, Florida

is active again with a new 60-ft tower and a Triband beam. K9AEQ received a well-earned A-1 Operator certificate and together with K9ELT keeps WIN operations running smoothly with a high level of activity. K9EVB work KR6LP to complete his WAC. IKY, now settled at the new QTH, stepped up his activity on both the phone and c.w. nets, RACES and managing the Brown County Emergency Net. QJW advises that K9CJN/9 operated from Rib Mt. during the V.H.F. Contest and had 13 contacts in 2 states with 100 watts and a two-element beam. Operators were K9CJN, K9GSE, K9DOP, QJW and VE2DQB/9. Officers of the newly-formed Waupaca Amateur Radio Club are DPN, pres.; KN9MAS, vice-pres.; KXK, secy.-treas. K9JQV handles the club's activities. There are 16 members and meetings are held the 1st Wed. of each month. KXK received a certificate from the Wireless Institute of Australia for being winner of last year's VK/ZL DX Contest in the W9 Area. Paul now has a DX record of 216 worked and 208 confirmed. CIZ, DPN and VWX are on 2 meters and monitor the band every hour on the hour. OT has now moved to W6-Land permanently. A new Wisconsin club listing is now available from the SCM. The Rufus King High School Club, W9KQY, now is up to 37 countries confirmed and is waiting for an Idaho card for WAS. EPO is trustee and operators include K9s EEO, EEV, KBE and KN9s LWS, OVI and OZG.

WISCONSIN QSO PARTY

December 7

All Wisconsin amateurs are invited to take part in a QSO party, sponsored by the Milwaukee Radio Amateurs' Club in order to promote friendship and operating ability within the section.

Rules: 1) The party will begin at 10:00 A.M. CST and end at 5.00 p.m. CST Sunday, December 7. 2) All types of emission and all bands may be used, but a station may be worked only once regardless of mode or band. C.w.-to-phone operation is permitted but crossband work is not allowed. Stations are urged to work all bands from 2 throngh 160 meters to raise their scores. A station may compete on c.w. or phone or both, as desired. 3) The general call will be "CQ Wis." 4) Information to be exchanged during contact will consist of a QSO number, RS or RST report, county, operator's name and time of contact. 5) Logs should show times, station worked, signal reports sent and received, frequency, time emission, power input, QSO numbers sent and received, name, county. It is suggested that sheets from the ARRL Log Book be used for convenience and accuracy. Exchanges must be entered correctly. 6) *Scoring:* Count one point for such information sent and one point for such information received, for a maximum of two points per contact. Multiply the total contact points by the number of different Wisconsin counties worked for final score. Only contacts with other Wisconsin amateurs can be counted. 7) A traveling trophy will be awarded to the highest scorer, regardless of whether that score has been made completely on c.w., or phone, or is a composite of both. Awards will be issued to the first, second, and third place winners using c.w. and phone, phone only, c.w. only, Novice and mobile. Awards will be presented at a future MRAC meeting. 8) A self-addressed stamped envelope to K9CJK will bring contest forms. Send logs, posmarked not later than January 7, 1959, to im Buth, K9CJK, 2829 N. Weil St., Milwaukee 12, Wis. Judgments of the committee, consisting of W9s DYG QYW YZG and K9s ENB CJK, will be final.

See how many Badgers you can work during the seven-hour contest period. Get on the air December 7 and meet the gang!

K6LWB/9 now is K9PKQ at Baraboo, OO K9HIZ has a new Triband quad on a 50-ft. stick. W8SN now has 13 regulars in 12 cities for good coverage. DYG now is up to 206 worked and 191 confirmed. K9CAN is on 2 meters with c.d. work and has WAZ along with his Dad, GIL. Traffic: (Sept.) W9CXY 882, SAA 180, DYG 139, KQB 114, K9ELT 69, AEQ 37, W9UFV 24, CBE 17, NRP 17, K9GDF 12, LMX 11, W9OT 11, K9GSC 10, W9QJW 10, MWQ 9, GFL 8, VHP 8, OVO 6, K9IQO 4, W9VIK 4, K9ALP 2. (Aug.) W9OT 6.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, W0HVA—SEC: K0JLW. PAM: YCL, RM: K0CNC. North Dakota 75-Meter Phone Net NCSs include YCL, K0CNC, GRM, AZX, IAB and JLW. Among the North Dakota hams who attended the Dakota Division Convention at Sioux Falls, So. Dak., were K0CNC, ESO, GRM, RDA, PZN, W0EOZ, DMJ, HVA, YCL and GWH. K0HDA came home with the second prize, and Eldieo S.S.B. mobile transmitter. K0CNC took his Extra Class exam, and now holds an Extra Class amateur license. The North Dakota C.W. Net again is in session; meeting every Mon., Wed. and Fri. at 6:30 P.M. on 3670 kc. Don't forget to pass along your news items to me. I can't put them in QST unless I get them. Traffic: W0YCL 35, K0CNC 32, JLW 22, ADI 16, MHD 6, GRM 5, W0IRN 3, K0KBV 3, KJR 3, W0PHC 3.

SOUTH DAKOTA—SCM, Les Price, W0FLP—Asst. SCM: Gerald F. Lee, 0YKY. SCM assistants: FKE and NEO. SECs: YOB and GDE. PAM: SCT. RM: GWS. The S. D. 75-Meter Phone Net, which meets daily at 6:30 P.M. CST, plus Sundays at 9:30 A.M. CST on 3870 kc., reports 33 sessions; QNI 795, high 34, low 7, average 24.09; QTC 74, high 5, low 0, average 2.24; informals 81, high 7, low 0, average 2.454. The nets need more outlets into Rapid City, Pierre, Yankton, Sioux Falls, Mitchell, Brookings, Huron and Redfield. The S. D. 40-Meter Noon Phone Net meets Mon. through Sat. at 12:15 CST on 7225 kc. and reports 24 sessions; QNI 350, high 23, low 9, average 14.58; QTC 109, high 17, low 1, average 4.54; informals 27, high 3, low 0, average 1 plus. The S. D. C.W. Net meets Mon., Wed. and Fri. at 7:00 P.M. CST on 3645 kc. and reports 13 sessions; high 11, low 2, average 5.69; QTC 12, high 3, low 1, average about 1; informals 4; sessions per station: AYD 6, K0BMQ 12, W7BHH 1, K0CWJ 11, JBM 3, K0KLR 1, K0KYK 2, OOU 4, OIJ 8, K0QMC 3, SCT 13, K0DUR 2, W3CEZ-K0IQJ-OII-K0MMZ/6-K0LHH 1. K0DPD is back on the noon net after trouble with the Viking. YVF and K0DHA swapped the Ranger for a Valiant. K0GJX, Sioux Falls, is on 50.120, 50.240 and 50.700 Mc., using a Globe Scout 680, a five-element beam 35 ft. high and an NC-98 with a FCV-1. K0EWJ won the pre-registration prize, a Viking Courier, at the Dakota Division Convention. NNX got a credit certificate on a Vestro tower. BPH, K0JOK and K0MDF are back at U.S.D., the latter two mobile and the former a home station. Traffic: W0SCT 286, FLP 12, OFP 1.

MINNESOTA—SCM, Robert M. Nelson, W0KLG—Asst. SCM: Bob Schoening, 0TKX. SEC: TUS. RMs: K0DIA and K0GCN. PAMs: QVR and TCK. K0EWC wishes to thank the many amateurs who sent him cards and letters while he was in the hospital. RGR is back from the Army and has resumed his regular activities as OBS and co-editor of the Minneapolis Radio Club paper. Two other amateurs just began their terms in the service. They are QDP, who left for San Francisco and duty with the Navy, and K0DNM, who left for Texas and his Air Force basic training. Before leaving, QDP completed his countries and sent in his QSL cards for the DXCC Award. MVH has returned to the Canal Zone. Look for him as KZ5CN. JVM was hospitalized for major surgery. QVQ and QVR have a new addition—a baby girl! K0KYK has a new NC-109 receiver. BWM has a double sideband rig on the air. K0LBC is operating 0 in Minneapolis and is enrolled at the University. K0GCN is attending McAllister College in St. Paul. K0JCF is attending college at Mankato. HKF has had an illustrated construction article published in *Popular Electronics*. K0JJE, from Medelia, got his General Class license and enjoys ragchewing on 75 meters. Three stations made BPL this month—K0DNM, K0KYK and KJZ. The St. Paul Radio Club got its new code class under way with 50 persons enrolled. Several amateurs from the Twin Cities and surrounding area attended the Upper Midwest Trade Exposition, the first one held in this area. Traffic: (Sept.) K0DNM 628, IDV 294, W0KJZ 260, K0KYK 146, GCN 93, W0KLG 84, K0GVS 66, ORK 59, W0PET 57, K0JCF 48, W0KFN 47, K0EPT 40, W0OPX 36, K0MIJ 35, W0WMA 33, QVQ 25, UMX 21, QVR 18, OJG 17, K0MGT 16, W0ALW 14, BUO 14, HEN 13, TCK 11, LST 10, DQL 9, EMZ 9, K0IZD 7, W0OJK 7, K0MNY 5, JJE 4, W0FGP 3, K0GKI 3. (June) W0KJZ 64.

DELTA DIVISION

ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR. PAM: DYL. RM: 8ZJ. The Osceola Amateur Club had a communications booth set up at the Mississippi County Fair and created a lot of interest through operating and traffic-handling. The portable emergency-power generator and various gear was on display. The club at Fayetteville is very active and has code practice 5 days per week and theory one day. The Razorback Net meets nightly at 8:30 on 29.000 kc. The club at Paris is increasing in number. EC CEU

(Continued on page 138)

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reports 14 stations active in emergency drills. K5GRT has a new RME-4350 receiver. The club at Pine Bluff now meets at the AP&L Bldg. KGJ and K5VFX have appointed Asst. ECs for Sebastian Co. GUE is in college in Rolla, Mo. K5QYC is in college out of the State. ZZY built a new ham shack. We urge all Arkansas hams holding AREC appointments to check your certificates and send them in if endorsement is due. K5MAD and QYC (who are brothers) recently passed the General Class exam. Don't forget to support your local emergency and traffic nets. Traffic: W5BYJ 73, SZJ 62, K5HYD 43, W5CEU 23, ZZY 20, W7BED/5 7, W5IAI 4, K5GRT 3, W5UED 3.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—K5ANN, of Crowley, has been selected to fill the position of EC in pince of K5EAX, who passed away in August. K5ABD boasts a gas generator for emergency power. 8PZ has been transferred back to New Orleans after a two-year tour of duty at Ft. Worth. A new radio club, the Ozone Belt Amateur Radio Club, has been formed at Slidell with 12 members and a 300-watt club transmitter complete with emergency power. Officers are ANA, pres.; K5CVK, vice-pres.; FSA, secy.-treas. V8R reports that after two years in an apartment he is now in his own QTH and back on the air on 40-meter s.s.b. K5LVB put up a new beam and is working lots of DX. K5IHP now has a Viking II. MXQ, who retired in October after umpteen years with NOPSI, is busy keeping skeds with LAN, RN5, MARS and any other net that will pass him traffic. K5LKC reports that a new club has been organized called the Ark-La-Tex Amateur Radio Club with K5LKC, pres.; K5EGD, vice-pres.; K5DZT secy.-treas.; K5PMD, act. chairman. New hams in Shreveport include K5SBF, who is running a Viking II; K5SFG, with an Elmac AF67; K5SJJ, running a very potent 2-watt mobile, and K5RKH with a Globe Scout. KØBBH is operating portable in Bossier City. K5EMJ is working on a portable rig. The Nitwit Net gathering was a huge success. CEZ is fighting grass and nets while working on converting a BC-625 for 6-meter use. A newsy letter was received from KTD. Martin has 23 states confirmed on 2 meters. His rig on 2 runs 250 watts, 4X150 final, 40-element beam (4 ten-element Yagis). The receiver is a 410B preamplifier to a 417-417A crystal converter. Traffic: W5CEZ 461, MXQ 94, K5LKC 24.

MISSISSIPPI—SCM, John Adrian Houston, sr., W5EHH—K5HYO, DLN and EEC displayed amateur radio equipment at the Bolivar County Fair in September. K5HPV has succeeded in getting his 75-meter doublet to load. K5LEA has been working much DX on 15 meters. One of his V7ODs has burned out now. K5HYO has been modulating with one 5514 burned out. He is changing over to 811As. K5QDJ, RSE, QDM and QXF recently dropped the "N" in their calls and are heard on 75- and 20-meter phone. GUU is State Army MARS director. He visits with A.F. MARS frequently on Mon. nights at Greenville A.F.B. EHH is in the process of building a new mobile rig and hopes to be working you fellows mobile soon. Traffic: W5TIR 21, K5GRV 9, W5RIM 8.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: RRV. RM: NHT. PAMs: VQE, UOT, PAH and ZZ. Welcome to VJ, back from Europe. We are sorry to hear that PL is ill and hope for the best. We sure will miss Ben's traffic report. Thanks to VQE, PFP, PAH, NHT and K4JNK for net reports. Best wishes to the Teen-Age Net with K4JNK as manager. ZZ would like some volunteers as NCS for the 6-meter net in the middle of the State. K4SWI reports on plans for a 300-watt amplifier to be driven by his new DX-40. Honorable mention goes to K4KYO for OO reports, K4KYL for OES reports and 5RCF for the BPL award. Traffic: W5RCF 787, W4PL 416, OGG 124, K4LLB 58, JNK 43, W4IGW 35, PFP 32, VJ 30, NHT 25 ,PAH 15, UIO 15, ZZ 15, K4KYO 13, W4VQE 12, DTI 10, RRV 10, CXY 8, K4KYL 4, W4JVM 2.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: William C. Alcock, 4CDA. SEC: JSH. RM: K4AIS. PAMs: OGY and K4MMW. S.S.B. PAMs: NGN and K4HBF. V.H.F. PAM: K4LOA. Thanks to CDA, who has agreed to serve as Asst. SCM. Al will continue to publish the bulletin and act as my adviser. Everyone is certain to miss OGY who is leaving the State. He did an FB job on KPN. OGY reports NCS and liaison stations are needed. BEI, W8LKA, K4QCR and SZA/4 are new members of the KPN. K8N has picked up with NGN, K4KYZ, EMR, HBF and BGP as NCS. K4LOA asks everyone to listen for KY6M Tue. and Thurs. at 1930 and Sun. at 0800 CST on 50.57 Mc. Hanks says eastern v.h.f. activity is needed. Good luck to ELG, GTC and K4CSH, new OBSs. K4KIL will be off the air for the

(Continued on page 140)

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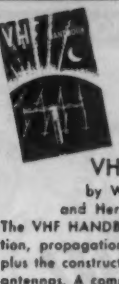

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winter. K4KIS has an SB-10 for his DX-100. K4BUB sent an FB OO report. K4KIN now is on s.s.b. MWX was the proud winner of the Drake receiver at the Lexington Hamfest. OGY is working on a mobile rig. SZL has entered Baptist Seminary at Louisville. Dan also is on s.s.b. K4QHZ made WAS in three months. K4OAH will be working for BPL in the coming months. JSH will be on 6 and 2 meters soon. KKG has a new HT-32 and a 75A-4. K4LHQ has five new antennas. KKW's son Ralph has entered the Air Force and will be stationed in England. OES K4SPJ is building a 220 transceiver. Traffic: W4ZDB 284, K4AIS 123, W4GTC 93, SUD 87, OGY 77, K4CSH 69, OAH 69, W4RPF 68, K4MMW 61, W4JCN 52, KKG 43, K4KIN 39, W4KKW 39, NGN 34, ELG 30, K4LHQ 24, HBF 20, KIS 18, W4MWX 17, CDA 13, K4KIL 10, W4YYI 10, K4BGP 7, W4HNI 7, JSH 7, K4KYZ 5, EMR 4, HOE 3, W4SZB 3, SZL 3.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—SEC: YAN. RMs: DAP, FWQ and OCC. New appointments during September included JXX as EC Macomb County; SLV as EC Livingston County. QQO managed to lead the pack with his traffic total despite being very active on a very busy TVI committee as well as heading up a growing AREC group. FX is working on 1920-vintage gear for the Ford and Michigan museums. That seems to explain why his car trunk was so loaded with antique components at the QMN picnic. SCS has a new Triband beam supported 60 feet in the air and has high plans for some winter operating now that the power company has cleaned up the noise from the high line constructed just after he bought the QTH. We have lost two good brothers who have moved to other parts of the country. Ex-SCM, DLZ, moved to the State of Washington and DJN moved to Florida. Both of these fellows have contributed much to our Michigan activities and I'm sure that all of the gang join in wishing them both the best of luck at their new QTHs. The Motor City Radio Club has elected the following officers: QFM, pres.; SSO, vice-pres.; NBF, treas.; and CZP, secy. New officers of the Blossomland Amateur Radio Assn. are QQO, pres.; K9LAP, vice-pres.; QOT, secy.; L. Dettman, treas.; and IEV, act. mgr. The "Brass Pounders" (Pt. Huron) elected BDI, pres.; WMN, vice-pres.; AZC, secy.-treas.; and FWQ program chmn. 9DWC visited the gang in Southwestern Michigan and gave a very interesting discourse on S.A.C. communications and operation. His comments were heard by two hundred hams from the Michiana Area at a meeting sponsored by the Heath Co. Radio Club. The Berrien County AREC units provided emergency communications in Hartford during a communications "blackout" resulting from a severe storm early in the month. Their mobile and fixed relay stations provided communications until commercial circuits were restored. Much was gained and preparedness paid off. Traffic: (Sept.) W8QQO 151, FWQ 146, OCC 111, FX 68, ILP 44, K8NAY 44, HVQ 26, W8YAN 24, DJN 23, JKX 20, WXO 16, AHV 15, VYG 13, K8CKD 12, W8NOH 11, K8ABW 8, W8FOV 8, SCW 7, AUD 2, EGI 2, HKT 2. (Aug.) W8SCW 10.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: UPB. RMs: DAE and VTP. PAMs: HPP, HUX and HZJ. K8s HDO, KRD, GVG, HSU and HRX received their General Class tickets. The Greater Cincinnati ARA's Stag Hamfest was the largest yet with nearly 1100 amateurs attending. K8ECJ won the Central Electronics 100V and K4BQA won the beam, tower and rotator. SPF, our Great Lakes Division Director, and Carty, our SEC, were there. Some of the Hamfest's highlights were a model aeroplane show, an antique auto show and the U. S. Marine Corps Reserve Communications Unit demonstration of radioteletype and field station vans. JDN went on the N.R.O.T.C. summer training cruise. K8CZJ is a freshman at Case Institute. The Ohio State Highway Patrol appealed to the Cuyahoga County AREC to furnish communications in the hunt for a lost child and AEU, LHX, QLB, QXG, TFW, K8s BVI, CDA, DHX, DJC, GJW and JHZ took part. Your SCM attended the Findlay Hamfest along with more than 250 amateurs and their families. CBT won the SC-101. The Springfield ARC's *Q-5* tells us the members have a well-attended code class and furnished communications at a golf club tournament with BFP, DCJ, JRG, OKB and WXG taking part. CSA is now K1DXW. The Worthington High School Organization of Amateurs was formed with K8GUV, pres.; and ABM, RTF and TOO, advisors, and has a new DX-40 and an NC-183D in its club station. KN8s LAW, LBZ, LCQ, LEH, LEZ, KYO, MAF, MAG and MBC are new hams. The Kenton ARC had a weiner roast and has started a General code class. K8EKG is attending U. of Akron. Ohio Valley ARA's *Ether Waves* reports UOD is the proud papa of a baby girl, EZF has a new three-element Triband beam and plans are being made for another DXpedition. Toledo's *Shack Gossip* names OTK as its "Ham of the Month," and reports that K8GIW vaca-

(Continued on page 142)

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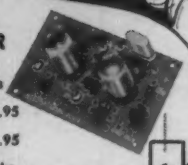

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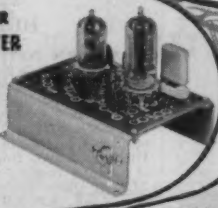

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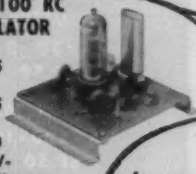
CASCODE PRE-AMPLIFIER

Kit, less tubes $4.75
Wired with tubes 6.95
Shipping Weight ....2 lbs.
For 6 or 2 meters

MODEL T-12
12-WATT CRYSTAL CONTROLLED TRANSMITTER

T-12 kit less tube and crystal ....$ 8.95
T-12 wired with tubes and less crystal 13.95
FA-5 crystal (specify frequency) .. 3.00
Special T-12 kit less tubes with 80 or 40 meter crystal (specify frequency) 10.95
Special T-12 kit wired with tube and 80 or 40 meter crystal (specify frequency) 15.95
Shipping Weight .....2 lbs.
For 80 or 40 meters

FO-1L 100 KC OSCILLATOR



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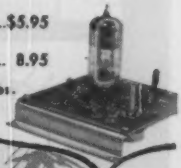
Wired and tested 15.95
100 KC crystal only .. 8.50
for use with FMV-1 10 KC multivibrator
Shipping Weight .....2 lbs.

FMV-1
MULTIVIBRATOR

for use with FO-1L 100 KC oscillator
Kit, less tube $5.95
Wired, with tube 8.95
Shipping Weight ... 2 lbs.



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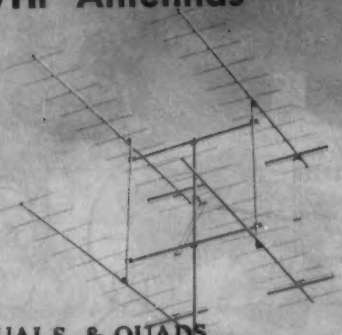

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¾ - 1¼ M.

A - 220 - 11

$8.50

A - 430 - 11

$6.50

2 METER

A - 144 - 7

$7.35

A - 144 - 11

$11.50

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A-50-5	120"	9.0
A-144-7	98"	10.0
A-144-11	144"	13.0
A-220-11	102"	13.0
A-430-11	57"	13.0

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tioned in Massachusetts, K8HIL vacationed in Kansas and SDZ is in the Air Force. K8JMF is in a hospital and it would be nice if you would write to him at Box 672, Stow, Ohio. I know the "King Fish" would appreciate the letters or cards or get into the "King Fish Nets" on 7275 kc. at 1000 EST or 7085 kc. at 2300 EST. The Lake Geauga RC held a hidden transmitter hunt. Winners were RBC and UXB with IMH, SZU, HAE, GQO, SSI, CFX, SRU, RCG and QLJ taking part. K8COI received WAS (Worked All Sadlers) and POOS certificates. GFE has a new quad. UPH is on s.s.b. with an HT-32. IBX received the DUF-1 award. Clermont County ARC held its Annual Picnic. IGE has a new Viking Ranger. YGR worked KX6, UC2 and UA9. FDR and AL received the W-Conn. Award and share the honor of being the first W8s to receive it. GFE and UPH made BPL in September. New appointments in September are OPA, K8DHJ and K8DKW as OOs and K8BDT as OES. IMW has a lawn-mower mobile on 6 meters. AQ vacationed touring the West. BUM vacationed a month in W6- and W7-Land. GUP has a new Johnson 500. K8BYC has a new 10-meter beam. OHP was married and is mobile. WNM is back on 2 meters. The Canton ARC and the Massillon ARC held a joint picnic with 42 amateurs and their families attending. K8DHJ won a JT30 mike. K8EJN also won a mike and QJW won a Conelrad receiver. Traffic: (Sept.) W8UPH 1156, AMH 241, GFE 183, DAE 118, VTP 118, HXB 88, OPU 81, LT 71, QLJ 64, AL 48, K8ELJ 48, W8IBX 31, RO 27, K8HDJ 24, W8AAU 17, WE 12, K8DTZ 10, W8HPP/8 10, UCW 10, K8HDO 9, W8HZJ 9, YGR 8, BEW 7, QCU 5, K8DXZ 4, HEJ 4, HYJ 4, W8LMB 4, QIE 4, WYS 4, HYJ 3, STR 3, WTO 3, BLS 2, WAB 1. (Aug.) W8QLJ 195.

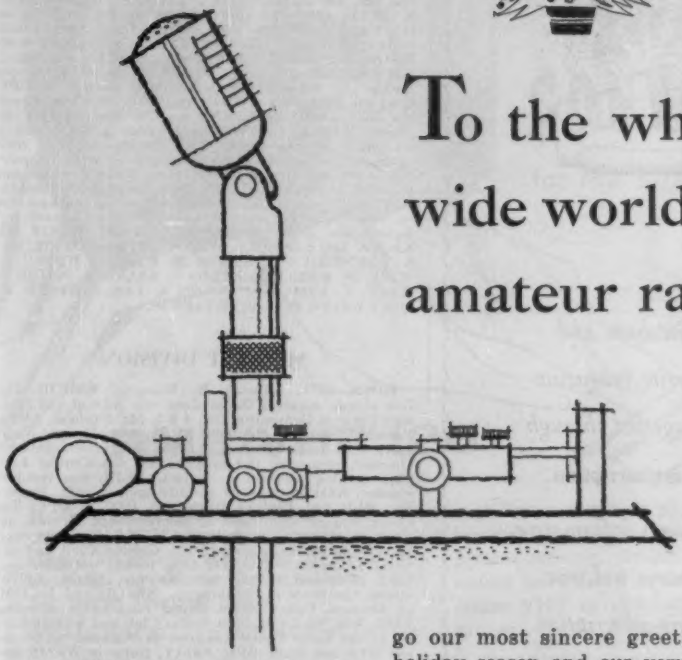
HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900, NYSPTEN on 3925 kc. at 1800, IPN on 3980 kc. at 1530, ESS on 3590 kc. at 1800, ENY (emerg.) on 29.490 and 145.35 Mc. Fri. at 2100, MHT (Novice) on 3716 kc. Sat. at 1300. Congrats to W2PHX who was married Sept. 27. Dick has moved from Yonkers to New City with plenty of antenna room. New appointments: K2CVG and K2ZLX as OESs. Endorsed: W2KGC as SEC. The Pelham H.S. Club, K2OXR, is on the air with 50 watts and a Super-Pro with long wire. The Albany Club held Old Timers Nite Sept. 26. WV2AKK will be more active with the new HQ-110, homework permitting. K2EDH worked for the Bureau of Standards in Colorado during the summer. Jon is now attending Swarthmore College. K2YFI says the new cubical quad has exceeded his expectations. A new Novice in Westmere is WV2AZP. Net certificates for NYSPTEN were issued to W2FVP, K2YZI and K2ZAU. The RPI Club, W2SZ, is active with traffic-handling and RACES Command Net activities. His many friends in E.N.Y. mourned the passing of W2SJV, former SCM of W.N.Y. Schnectady Co. EC W2WWK retires from G.E. this fall. Frank says Florida in winter and Scotia summers will keep him busy. W2GTI looked up hams while in Dallas early in September. The Schenectady Club held a very successful auction at its Oct. 6 meeting. We wonder if the newer clubs are not overlooking the promotional possibilities offered by a simple news sheet. It's relatively inexpensive and keeps your members informed and interested in your club. Try it. Traffic: (Sept.) K2UTV 275, K2YTD 191, K2YZI 147, K2VTW 61, W2EFU 52, K2UYK 52, W2ATA 46, K2QJL 31, W2SZ 23, WV2AKK 22, K2LKI 11, K2RKY 10, W2FVP 9, K2CKG 6, K2HJX 4, K2ZAU 3. (Aug.) W2PHX 95, K2QJL 34, K2RKY 11.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2WFL. PAM: W2OBW. V.H.F. PAM: K2EQH. Section nets: NLI, 3630 kc. nightly at 1930 EST and Sat. and Sun. at 1915 EST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. NYC-LI AREC, 3908 kc. Sun. at 1730 EST. V.H.F. Traffic Net, 145.8 Mc. Mon.-Wed.-Fri. at 2000 EST BPL cards were earned this month by W2KEB, W2JGV and K2PTS, the latter two on originations plus deliveries. Congratulations to K2PTS, who joined the BPL ranks for the first time with his fine effort. K2QBW received his WAC and WBE certificates. K2LCM earned a CP-20 certificate. W2IVA, W2PF's son, returned to M.I.T. for his senior year. The U.H.F. Club of Jamaica, working as W2DYM/2 from Staten Island, contacted W3VIR on 432 Mc. A new son has joined the family at K2RJO. K2AAW increased his mobile power to 25 watts and is enjoying better contacts. K2QZS completed a new 2-meter receiver. A new "J" antenna is in use at W2EHA. W2IGH is on the air with a DX-100 and an SX-101. W2JCA vacationed in VE-Land. W2MDM added panoramic equipment to the shack. K2OEG needs only North Dakota to complete

(Continued on page 144)

To the whole wide world of amateur radio...



W2LAL	K9CLH
W2NRE	K6KII
W5ZNM	K9KGI
W6HV	W9CXL
W6MEG	W9IDI
W6VNG	W9JMD
W8MTZ	W9NTI
W8NPO	W9PXL
W9BAQ	W9QYX
W9BBC	W9URS

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his WAS. W2AEE is using a 6N2 with Tecraft converters. K2KJV is handling traffic on 40-meter phone with a Globe Scout. W2LYH has built crystal-controlled converters for 10, 15 and 20 meters. W2RQG is moving to Orlando, Fla. New officers of the Chaminade HSRC are K2TIM, pres.; K2DTJ, vice-pres.; P. Conway, secy.; and KN2EXG, treas. The club station, W2JTZ, uses a 75A-4 and a 300-watt rig with separate rigs for Novices and Technicians. K2SVY is active on 6 meters with a TBS-50 and an S-38E with a Tecraft converter. K2QGA dropped the "N." The Levittown ARC visited W1AW and League Headquarters in mobile caravan style. A new member of the club is WV2AQE, known professionally as Jackie Jay, a TV and club comedian. K2YJC is on the air from his new QTH in Stony Brook. W2PRU is trying s.s.b. New officers of the Stuyvesant HSRC, W2CLE, are K2RDP, pres.; K2UMT, vice-pres.; and KN2KVL, secy. The club returned to the air with an HT-9 and an NC-98. New officers of the Long Island 6-Meter Emergency Net are K2VLX, net control, with K2RBS and K2RKL as alternates; K2RMA, act. mgr.; K2YBW, asst. act. mgr. K2DZA is the net's bulletin station and W2ACH acts as technical advisor. W2OBU is on the air with a new DX-100B. The W-Conn Award has been earned by K2RNV on c.w. and K2MHY on phone. W2TUK and W3ZRA/2 added a 75A-4 and a kw. linear to their shack. With the ice and snow once again with us, all mobileers are urged to use extra caution in driving. If your news item or traffic total has not appeared in this column, it will be included next month. Your SCM was called to Norfolk Va., on business for six weeks and this column was written on a week-end flight home. Traffic: (Sept.) W2KEB 3584, W2JGV 357, K2QBW 331, K2PTS 186, W2VDT 163, K2DEM 129, K2KJV 92, W2DUS 72, K2LCM 23, W2EC 10, W2OBU 10, W2PF 10, K2RKL 9, K2RJO 7, K2AAW 6, K2TSE 6, W2IIU 5, K2MEM 4, K2QZS 4. (Aug.) W2AEE 47. (July) W2AEE 32. (June) W2AEE 90.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—The Des Moines Amateur Radio Assn. was host at the Midwest Division Convention Oct. 4 & 5. Mr. Dosland, ARRL President, and Mr. Huntoon, ARRL Asst. General Manager, were featured speakers. NWX, Midwest Division Director, sponsored the program for the Central Iowa Club meeting. General A. Najera, XE1H, was featured speaker, KØMMZ received an ORS appointment. Renewals: BLH and BQJ as ORSs and JDV as OBS. The Cedar Rapids Club held a hamfest Sept. 7 with 568 registered guests. The Bedford Club held a picnic Sept. 14 with 56 hams registered. The Creston Club and the Great Lakes Club also held their picnics the same day. UJC vacationed in the New England States. KØIHC visited the State of Washington. KØKQD and his OM, of Alamosa, Colo., visited several Iowa hams, including BDR. The Northeast Iowa Radio Club had a station set up at the Dairy Cattle Congress in Waterloo under the call DVL and made BPL. KØEIY, formerly W9PJR and Iowa SCM, has joined Silent Keys. KØBPR has a new SX-101. MYJ is slated to join the armed services. KNØ-RHI and RHH are new Novices in Belle Plaine. QVZ passed the General Class exam. Traffic: (Sept.) WØSCA 1603, BDR 1524, LGG 876, PZO 792, KØCLS 364. WØGXQ 270, DVL 185, NYX 131, QVA 113, KØMMZ 94, WØKVJ 86, KØIQB 72, MIB 72, JPJ 67, BLJ 54, LCX 54, WØNGS 49, KØOWM 44, WØLJW 43, KØAUU 38, WØSLC 35, KØEXN 33, WØWBK 31, VWF 18, BLH 14, UTD 14, KØBRE 12, KAQ 10, WØZMU/Ø 10, KØGOQ 9, GXP 9, WØFDM 8, LSF 8, MEL 8, KØIGU 7, WØPTL 7, KØDPT 6, HRD 6, JMA 6, LKE 6, WØUHO 6, YDV 6, EEG 5, UIZ 5, RBT 4, EDQ 4, FMZ 4, KØHFQ 4, IHC 4, WØIII 4, KØJGM 3, MFX 3, WØPHT 3, CYL 2, COD 1. (Aug.) WØNGS 261.

KANSAS—SCM, Earl N. Johnston, WØICV—SEC: PAH. RM: QGG. PAM: LEW, V.H.F. PAM: ZJB. The Wheat Belt Radio Club's Annual Picnic held in September was attended by over 100 persons, 39 of whom were licensed. Some mighty nice prises were given, such as a Vibroplex bug, won by UOL; a Q Multiplier, by SYZ and a Reflectometer, by KDW. KØELU won the "Worked Most Club Members" award sponsored by the WBRC. UWN reports that Waterville now has 12 hams. UWN has a new SX-100. KØIRL has a new Globe King linear. KØKMZ reports the Sundown Novice Net and the Sundown Traffic Net are making good progress. Activity reports are fewer this month probably because of the absence of this column in *QST* for the two months I was in Canada. I hope you fellows will support my successor, FNS, as well as you have me. I want to thank all of you who have so generously helped in reporting your activities and especially the appointees of the key posts who have assisted me for the past ten years. Your generosity will never be forgotten. 73 and 30. Traffic: WØTOL 482,

(Continued on page 140)

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MISSOURI—SCM, James W. Hooker, WØGEP—Net reports: (Aug.) MEN; 9 sessions reported; QNI 314, QTC 82; NCSs, OVV 2, VPQ 1, IZN 1, OHC 4, OMM 1, (Sept.) MEN; 12 sessions; QNI 379, QTC 98; NCSs, BUL 2, OMM 3, OHC 4, VPQ 3. MON; 52 sessions; QNI 234, QTC 167; NCSs, OUD 40, GBJ 5, RTW 4, PME 3, KØONK 1. CPI enjoyed a three-week vacation on the Gulf of Mexico. UXT has a Communicator on 2 meters with a 54-ft. tower and 5-over-5 beam. KØHHG has a new 10-meter beam. Three new Novices in West Plains are KNØs QKJ, QKK and QKM. KØKOB has a new WRL 755-A v.f.o. KNØRIN received an OES appointment. KØJPH bought an SX-28 after receiving his General Class license in August. KA made good use of his sideswiper with GEP's mobile on 80-meter c.w. while traveling to the Midwest Division Convention. KØONK is manager of the Handycaper Net, which meets on 7280 kc. at 0300 Mon., Wed. and Fri. and 0900 on Sat. *HARC News* states that 35.5 per cent of the hams in the Greater Kansas City Area have K calls. There are 23 sets of "twin calls" in the area. PME was the reporting representative of MON at the Midwest Division Convention. Your SCM was pleased to renew acquaintance with PME, SBY, SQB, GXP, NNM, KA, OIV, MNW, PMU, IGU and TBI at the convention. To the others of the Missouri gang, please excuse my memory and lax bookkeeping in not being able to list your calls. Traffic: (Sept.) WØCPI 517, KØONK 192, WØUXT 182, ARO 162, OUD 127, VPQ 104, KØHHG 92, KBD 90, WØKIK 87, BVL 53, RTW 52, GBJ 38, BUL 13, KØIHY 12, CFY 6, WØKA 2, WAP 2, GEP 1, KØKOB 1. (Aug.) KØCFY 3.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—Your SCM attended the very fine Midwest Division Convention at Des Moines. The boys in Eastern Nebraska are doing a fine job on 10 meters, both mobile and fixed, for emergency work and c.d. The Western Nebraska Net report for September is QNI 576, QTC 76. This net operates on 3850 kc. daily at 0700 and all who can are invited to take part. NIK is NC. The Nebraska 75-Meter Emergency Net, on 3983 kc. daily at 1230 CST, reports QNI 477, QTC 40. As of Sept. 1 there were 21 stations on roll call. The Nebraska SS Net started off to a good start with 11 members and QNI 196, QTC 69. The Nebraska C.W. Net, on 3525 kc. daily at 1900 CST, reports QNI 255, QTC 75. The Nebraska Morning Phone Net, on 3990 kc. at 1730 daily with KØDGW as NC, reports QNI 614, QTC 168. The North Platte Picnic was held Sept. 21 with a good attendance and a good time reported by all. The Wheat Belt Club and the North Platte Club held a joint meeting in McCook on Sept. 12. Traffic: WØMAO 130, KØIJW 100, BDF 66, MQC 60, WØZJF 58, ZWG 57, NIK 50, KUA 43, OKO 41, FTQ 36, BOQ 23, KDW 23, ZOU 21, OCU 17, KØHKI 16, WØEGQ 10, SPK 8, URC 8, QKK 7, HOP 6, KØKOK 6, WØPUT 6, VZJ 6, MTI 5, VEA 5, VGH 5, KLB 4, ZWF 3, AFG 2, KØELU 2, KJP 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—SEC: EOR. RM: KYQ. H.F. PAM: YBH. V.H.F. PAM: FHP. Traffic nets: CPN, Mon.-Sat. 1800, Sun. 1000 on 3880 kc.; CN, Mon.-Sat. 1800 and 2130 on 3640 kc.; CVN, Mon., Wed. and Fri. 2030 on 145.98 Mc.; CTN, Sun. 0900 on 3640 kc. KYQ advises that CN handled 325 messages, including 62 on the second session, during 26 sessions in September. K1BML's stacked "halos" attracted a lot of attention at the Providence Convention. K1CKZ has 16 states on 6 meters using a Communicator III and a three-element beam. YBH reports that CPN handled 215 messages during 20 sessions with an average daily attendance of 27. High QNI goes to K1BEN, K1AQB, W1FHP, W1DAV, K1ACC, W1VIY, W1MWB and K1AQE. FEA is busy with school work. LIG and PTS handled an emergency call from a K7 to New Haven. OAX has moved to New Mexico. YOL has a new tower. FHP reports that CVN handled 20 messages during 12 sessions with an average of 7 stations per session. MHF and K1BWJ appeared on HHR's "Ham Shack" program over WILI. RWS has moved to New Jersey. WHL advises that the Monday 6-Meter Net handled 20 messages during 5 sessions with an average of 18 stations per session. OPB is DXing on 15 meters. SFH entered the armed services. TYQ made 1031 QSOs while operating HV1CN. ZTT is an announcer at WPOP. Twenty members of the CQ ARC attended the Providence Convention. K1CRQ received the first W-Conn Award using only 6 and 2 meters. Nearly 100 hams attended a hamfest in Bethlehem Sept. 28. K1EEW won the 2-meter transmitter hunt and K1AOX won on 10 meters. KLK was presented with the W-Conn Award by the Meriden Jaycees Sept. 22. OBR has a new home-

(Continued on page 148)

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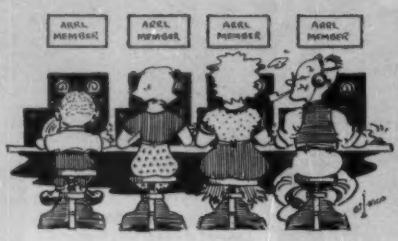

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made mobile transmitter and converter on 10 meters. 3IFA is attending Taft school in Watertown. K1BHM passed the General Class exam. K1BEB is pleased with his new VR keying system on the DX-100. NUB and EWK work at WICC. New appointments: KLK as OBS; CDM and K1IJF as OOs. APA renewed his ORS and OPS appointments. Reports received: OES from K1BML, K1CKZ, FVV, GTG, HQM, KLK, LGE, MWB and VWP; OO from K1AAE, K1AJJ, K1BEB, CDM, GIX, MBX and MWB. Traffic: (Sept.) K1AQB 528, BEN 336, W1YBH 284, KYQ 230, AW 220, ULY 116, TYQ 88, QJM 72, EFW 68, NJM 66, FYF 61, GVK 57, FHP 47, KLK 45, LV 37, MWB 36, RFJ 36, K1AQE 29, W1OBR 29, VIY 29, MDB 23, DHP 22, BDI 18, CUH 17, K1ACC 16, W1GIX 16, AVS 12, CUH 12, K1BEB 9, W1EJH 9, K1BML 6, CKZ 5, AAE 4, W1HAT 4, ORP 4, YBI 4, K1AJJ 1. (Aug.) W1EFW 90.

MAINE—Acting SCM, Charles F. Lander, W1QJA—SEC: QJA. PAM: VYA. V.H.F. PAM: JMN. RM: EFR. Traffic nets: The Sea Gull Net meets on 3940 kc. Mon.-Sat. at 1700, the Pine Tree Net on 3596 kc. Mon.-Fri. at 1900, the Barnyard Net on 3900 kc. Mon.-Sat. at 0800. IZK is using a Viking Valiant and an NC-173 receiver in his new set-up. QIH has a new Apache transmitter. HHC is constructing his new studio "Z." The Hoss Traders Net is back in full swing Sun. at 1700 with K1AKO at the controls. Any who desire AREC information or forms, give a call or drop a line to QJA. RSC is back on 75 meters and is keeping Bar Harbor on the airwaves again. VYA, our PAM, is back on the mend. C.d. activity is increasing with the cooler weather. It is with the deepest and sincerest regret that we announce losing our capable and honored SCM, John Fearon, to W6-Land. The mantle of gloom shared by old-timers and Novices alike is only lifted by the complimentary messages on the nets and in QSOs that are being paid LKP for the quiet and masterful way in which he carried out his assignments. John was always there in a pinch and it was a rare occasion when he failed to be on the nets to handle the lion's share of traffic. We hope Glendale, Calif., appreciates and profits by his presence as much as the Maine section has. Send John a card and we may hear him on with a W6 annex. All NCSs will have his address. Best luck, John. Traffic: W1GPY 122, LKP 104, QJA 60, CEV 52, UDD 51, FV 50, K1DPM 20, DWQ 14, W1IZK 13, BX 12, K1BXI 10, W1HYD 8, K1BYE 6, W1OTQ 5, K1BAY 3.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: K1CXN as OPS, EUJ as OES. BL, our State Radio Officer, has moved to Sudbury. Eastern Mass. was well represented at the Convention at Providence. The Merrimac Valley ARC is sponsoring a Mass. State QSO Party on Dec. 13-14. MUD has over 1000 QSOs on 2 meters. QKC is on 75 meters. K1IFQ is in Lynn. K1EKE is on 10 meters. JQA, K1GQZ, WTF and NMU are on 2 meters. Newcomers are welcome to check into our nets: Eastern Mass. C.W. Net on 3660 kc. at 1900 Mon. through Fri. and Mass. State Phone Net on 3870 kc. every day at 1800; also TCPN on 3970 kc. at 1700 each day. The Federation of Eastern Mass. Clubs met at JQ's QTH. The South Shore Club held a meeting. BGW has 198 countries and worked 2KH on RTTY. Don Wilson, 72 years young, is awaiting his KN1 call. The QRA had Mr. Roberts, of National Co., give a talk on receivers. DGN's son is KN1IRB on 7 Mc. KN1HRN is new in Foxboro. K1CEH is on 80-40-meter c.w. ETH has a 15-meter vertical. NTK has a Valiant and is working DX. DBY, LDT, UBC, K1BNA and KZB helped out in a hunt for a lost plane. K1BUR has a 65-ft. tower and a Triband beam. BW is all antennas and quad crazy. IGH moved to Milton. K1BBU is hot on 10-meter DX. UKO has a new dipole for 75 meters and a Heath-kit power and s.w.r. bridge. ADR, EC and RO, has a large active group for c.d. GYM is his Asst. RO. K1BYL has a new 50-watt rig. New calls in the New Bedford Area: KN1IQD has a Globe Scout on 80. KN1HJD has General on 40 meters. WU has the masts up and is putting up a Sterba curtain. K1AII is portable in Providence. KYC got his HR-5 fixed for 10-15 meters. NJL joined the Waltham ARA. The 6-Meter Crossband Net is going fine, says AWA. KN1INZ is new in Quincy. AJU/6 was here for a visit. KN1HQP is on 80 meters in Newton. DEL is in the Navy and across the pond. ORV now is in Arlington. ERN has his General Class license. K1DJG has a 150-B transmitter. BHW is active again. UOP has an NC-300. NNS is busy with his new Corp. A V.H.F. QSO Party was held at KN1HBA's QTH. He with K1CZQ, OFK and K1CZV were on the committee. K1AGE is going to Lowell Tech. K1DEY is active in the Eastern Seaboard Teenage Net on 7250 kc. Tue. and Fri. at 4 P.M. The Framingham Club had a talk by MV on DX. The T-9 Club met at GGV's QTH, and also at TYP's. KN1HQP will be on in Newton. Les Cushman spoke at the North Shore Radio Club. Officers are JLN, pres.; YYJ, vice-pres.; OGK, treas.; FOG, secy. GRP is now General Class. Another fine issue of

(Continued on page 160)

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the *Barnstable Oscillator* was received. Sector 2-D's new 2-meter frequency is 147.325 kc. This is the old Sector 1-B with headquarters at Stoughton. NVV and ZXZ are heard on 2 meters. NF got his Sputnik No. 1 QSL card. EUJ is building a crystal converter for 432 Mc. KBN will be on 220 and 432 Mc. LMU's OBS and OES appointments were endorsed. CGU is working on a new house. PIW has TBS on 10 meters. GEF is working on his 1 kw. LUW moved to Boxboro. UG is going to New Orleans in his boat. UH has a new ground plane on 10 meters. LMU is trying a.g modulation 10 meters. AHE/1 was at York Beach, Me., in the V.H.F. Contest. Traffic: (Sept.) W1EMG 431, UKO 381, AWA 261, EAE 121, K1DGI 54, DIO 53, W1AUQ 47, MIX 35, KBN 31, K1BYL 26, BUF 14, CMS 10, W1DIY 10, ATX 8, K1DGG 8, WITY 8, WU 8, K1AII 6, DEY 6, W1KYC 6, UE 6, NJL 5, AHP 4, EUJ 4, ALP 2, DTB 2, SMO 1. (Aug.) W1AWA 342, HGN 90, K1DGI 41, W1EPE 16, ATX 12, JBD 9, UE 8, AHP 6, DTB 2, SMO 2.

MASSACHUSETTS QSO PARTY

December 13 and 14

The Merrimack Valley Amateur Radio Club announces a Massachusetts QSO party in which all amateurs are invited to participate. Details follow.

1) The contest begins at 6 P.M. EST December 13 and ends at 11:59 P.M. EST December 14. 2) Suggested congregating frequencies are 3660, 3870, 7080, 7260 and 14,100 kc. 3) The same station may be worked for additional credit on more than one band. Phone and c.w. are considered separate contests. Stations may enter both but must submit separate entries. 4) General calls: "CQ MASS." Massachusetts c.w. stations identify themselves by signing "de MASS (call) K." Phones say "Massachusetts calling." 5) Contact information: Mass. stations send QSO number, RS or RST and county. Others send number of QSO, RS or RST and state, province or country. 6) Scoring: Each completed contact counts five points. Non-Mass. amateurs will multiply by the number of Mass. counties worked; Mass. stations will multiply by total number of states, provinces and countries worked. Multiply this total by 1.5 if input power remains under 150 watts at all times. 7) Certificates will be issued to the two highest-scoring stations in each state, province, country and county in Massachusetts. 8) Logs must show the date, time, emission, and power input as well as the required contact information. 9) Contest logs should be submitted to Contest Chairman W1HKA, c/o MVARC, Box 21, Lawrence, Mass. postmarked not later than December 31, 1958.

The Worked All Massachusetts Counties certificate (p. 62, September *QST*) will be issued to those who succeed in working all 14 counties during the contest, regardless of the type of emission used.

WESTERN MASSACHUSETTS—SCM, Osborne R. McKeraghan, W1HRV—RM: BVR. PAM: MNG. Net times are West Mass. C.W. Net at 1900 EST and the Mass. Phone Net at 1800 EST on 3870 kc. ORS appointments have been endorsed for EOB, DGL, DZV, FZY and KGJ. The Hampden County Assn. held an auction at its September meeting and had a swell turnout with a lot of fine gear changing hands. The Radio Club at the University of Mass. now has over 15 members and is growing. The station is well set up with a 75A-1 receiver, a Collins exciter with push-pull 813s final running 300 watts and a 6-meter rig and beam antenna. DGA reports a new high-voltage power supply completed and ready to run a 6-meter rig but school work at Lowell Tech. keeps him pretty busy. ZPB has been awarded a net certificate for 1RN and reports a very active radio club at Mount Hermon School with 25 members and regular code and theory classes. EOB has upped his countries-worked total to 212 and has a new three-element beam for 20 meters. DGL is enjoying his new Tribander beam. The Podunk Radio Club had a bang-up time at the Providence Convention, going as a group dressed as farmers. RFU reports making 18 contacts in 11 sections on 220 Mc. during the September V.H.F. Contest. Your SCM, HRV, will complete his current term in November. I wish to thank all the section members for their fine cooperation and assistance. I have fully enjoyed the many fine contacts and friends made during the past four years. I am sure that your cooperation with our new SCM, DGL, will be greatly appreciated.

(Continued on page 152)

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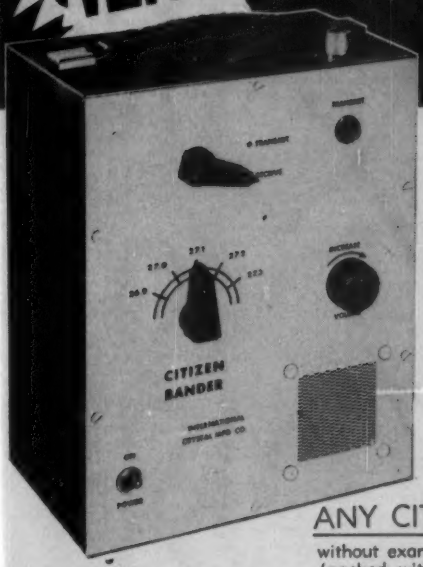

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NEW HAMPSHIRE—SCM, John A. Knapp, W1AIJ—SEC: BXU. RMs: COC and K1BCS. PAM: CDX. V.H.F. PAM: TA. The GSPN Picnic held Sept. 28 at KVG's QTH, Mirror Lake, was a most enjoyable event with approximately 80 in attendance. The Concord Brasspounders, OC, held an outing at Sunapee State Park Sept. 14. Approximately 85, including members and their families, attended. FTZ was selected MARS operator of the month for July, for which he received a certificate in recognition of outstanding contribution in the 1st Army MARS program. JNC and AIJ attended the Hudson Division Convention at Albany Oct. 11 and 12. K1BCS was guest speaker at the Franklin Rotary Club Sept. 16. His subject: "What Amateur Radio Means To Your Community." EVN reports interesting experiments with aluminum drainpipe antennas. Your SCM attended the New England Division Convention at Providence. Congrats to your new SCM, RMH. Good luck, Bob. My heartiest thanks to all for your splendid cooperation and assistance during my term as SCM. Season's Greetings to one and all. Traffic: (Sept.) K1BCS 295, CIF 88, W1HKA 80, QGU 67, MOI 35, KVG 24, EVN 15, AIJ 12, ENM 6. (Aug.) W1HKA 58.

RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ. PAMs: KC8 and YRC. RMs: BBN and BTV. GZA has been appointed EC for Warwick. K1ABR and K1CRN are new OESs. Congratulations to UHE, who recently had successful contacts with Virginia and Pennsylvania on 432 Mc. The East Providence Amateur Radio Assn. (EPARA) held its annual election Oct. 10. Officers are OLO, pres.; PPN, vice-pres.; LCP, secy.; HLY treas.; and K1BDN, act. mgr. The BVARC sponsored a Fox Hunt on 10 and 6 meters on Oct. 5 and the trophy awards went to DOR and K1IC8. K1GGF passed his General Class exam in September. K1IN8 is active on 40 meters. You can earn a "Worked PRA certificate" by presenting a log showing contact with 25 PRA members to YLB or CJT. This award became effective for all contacts after Oct. 7, 1958. DDD has a new cubical quad for 20 meters and is running 850 watts on a.m. The Johnny Cake Net (Wed., 2030 on 50.7 Mc., LSP mgr.) averaged about 15 stations per session in September. CMH has received his 30-w.p.m. Code Proficiency certificate and is waiting for his 35. The RIN (1900 on 3540 kc.) is in full session and welcomes new members. Traffic: W1YAP 88, YRC 50, TGD 25, CMH 23, LSP 20, WED 10.

VERMONT—SCM, Mrs. Ann L. Chandler, W1OAK—SEC: EIB, RM: K1BGC, PAM: ZYZ. K1BOL is a new OPS. Following are GMN's net controls Mon. through Sat., respectively: K1BC8, ZYZ, ZEW, VSA, HRG and EIB. EXZ is enjoying a BC-312N receiver on 50 Mc. BXT, net manager of the 7-Mc. Mike Farnd Net, reported traffic of 323 for September. A civil defense RACES meeting was held Oct. 5 at Montpelier to devise ways and means to better the RACES network. Keep an eye out for marine radio operator TLP/MM, who is operating on 21 Mc. from somewhere in the Pacific. ZEW has a new GPR-90. Congrats to K1BVH on the new YL harmonic. K1AUE now possesses both General and 1st-class commercial radiotelephone licenses. KN1HDB is enjoying his new Q-multiplier. KN1HKI is attending St. John's Seminary in Brighton, Mass. New BARC officers are TBG, pres.; WPJ, treas.; KN1HCZ, clerk; VSA, QQN and NLO, trustees. KN1GKL got married. K1CRF is being hospitalized at the Vet's Hospital in St. Johnsbury. K1CCR is mobile with a Gonset Triband. The following members of the Mike and Key Club of Middlebury are going v.h.f.. on 144 Mc.: EIB, EIC, HFS and TFB. A statewide v.h.f. emergency network is much needed. K6KVY (ex-MLJ from Barre) operates 14 through 28 Mc. Traffic: W1OAK 202, BXT 130, ZEW 90, KRV 61, K1BGC 25, W1AD 23, HRG 19, UWS 19, TXY 11, K1BOL 7. See page 154 for announcement of the 7th Vermont QSO Party.

NORTHWESTERN DIVISION

ALASKA—SCM, Eugene N. Berato, KL7DZ—BMZ was very active on phone in September. AWR also was active with 243 contacts, 22 s.s.b. CDF reports 10 meters opened up north of the Arctic Circle on Sept. 10 with CMI and CDF active. CMI, CDF and CQL now have phone relaying arrangements to the different dew line sites. CQL will move to KP4-Land soon. BLL, AUV, COT and CAT are hot on RTTY. AMV is joining the 6-meter boys this winter. CDG has moved outside. The Eskimo Amateur Radio Society (EARS) has elected CNW, pres.; CTE, admn. vice-

(Continued on page 154)

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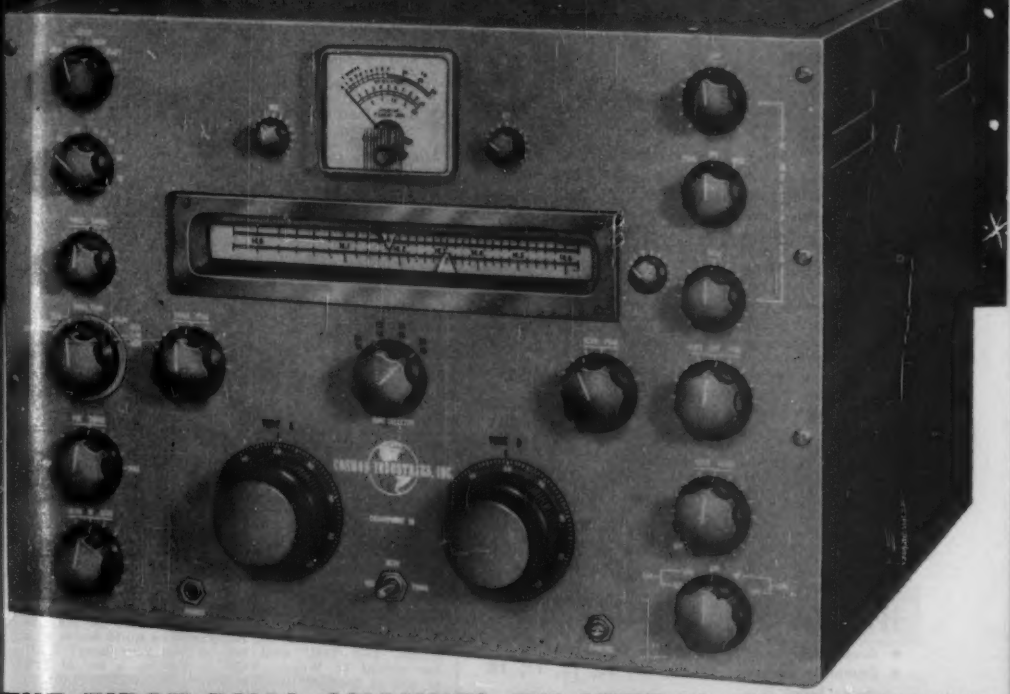

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SEVENTH VERMONT QSO PARTY

December 12-14

The Tri-County Amateur Radio Club of Brattleboro, Vermont, announces the 7th Vermont QSO Party and invites all radio amateurs to participate. Vermonters are urged to work as many out-of-state stations as possible, so that interested amateurs can earn credit toward WAS, WANE and W-VT awards. Here are the details:

(1) Time: 48-hour week-end period from 6 P.M. EST Friday, December 12, to 6 P.M. EST Sunday, December 14.

(2) No time limit and no power restrictions.

(3) Scoring: *Vermont stations:* one point per contact and multiply total by the number of states, U. S. Possessions, Canadian provinces and foreign countries worked. *Outside stations:* five points for each Vermont station worked and multiply total by the number of counties in Vermont worked.

(4) Credit for contacts with the same station on another band will be given in order to promote more activity on the higher bands.

(5) A certificate will be awarded to the highest-scoring station in each state, U. S. Possession, Canadian province and foreign country, and to the highest-scoring station in each Vermont county. In addition, a W-VT certificate will be sent to any station working 13 of Vermont's 14 counties, provided the station has not previously been issued this award. Party logs showing required data will be accepted in lieu of QSLs.

(6) Approximate frequencies: 3520, 3855, 7050, 7240, 14,100, 14,240, 28,100, 28,550 kc. and the 50 and 144 Mc. bands. Use as many bands as possible.

(7) General call: "CQ VT." Vermont c.w. amateurs should identify themselves by signing "de VT (call) K." Phones say, "Vermont calling."

(8) Contact information required: Vermont stations send number of QSO, RST or RS and county. All others send number of QSO, RST or RS report, and state, possession, province or country.

(9) Logs and scores must be postmarked not later than February 1, 1959, and sent to Tri-County Amateur Radio Club, c/o Harold Bover, W1DAQ, 10 Stewart Place, Brattleboro, Vermont.

Vermont Novices are urged to get into the fray. Also, amateurs in Bennington, Essex, Lamoille and Grand Isle Counties, please plan to be active. Everyone interested, mark your calendars now so you won't forget. Good luck!

pres.; BRU, tech. vice-pres.; CRB, secy.; CQZ, treas. The EARS is on Fort Richardson. BHE and PIV have moved outside and plan to take on a foreign assignment. W4RCM/KL7 is a new ORS in the Fairbanks Area. CUQ is on s.s.b. The Anchorage Amateur Radio Club had a successful equipment auction with a good turnout although the weather was bad. Traffic: (Sept.) KL7BJD 138, AWR 28, CDF 23, BMZ 17, BLL 5, CRE 3, CEJ 2. (Aug.) KG1DT 583.

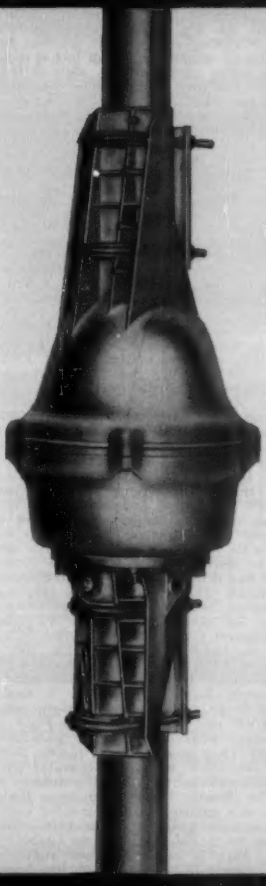
IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—Congratulations to JHY on being elected NCS and Net Manager for the FARM Net. Thanks to the fine job done by past officers. Reports were quite scarce this month. Did YOU send one in for your area? ZRC has moved to Weiser. VQC is working a lot of DX as well as handling the University traffic. The Pocatello Club got a bunch of surplus receivers from RACES and is hooking them up. CDA's XYL is now K7GCS. The Pocatello GGV Net handles traffic on 75 meters each morning at 8:15. While on vacation GCO crossed the corners of Nevada, Utah, and Arizona in contact with K4GLF and sent him three QSLs for his WAS. Director CPY visited the Pocatello Club meeting in October. WBK has moved to Rexburg. Check your neighboring hams to see if they belong to RACES and ARRL. Traffic: W7VQC 33, EEQ 27.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI—SEC: KUH. PAM: EOI. RM: KGJ. The Montana Phone Net meets Mon.-Wed.-Fri. at 1800 MST on 3910 kc. OHH has a new baby boy. K7CCZ has a new baby girl. ED travelled in Europe and attended the World's Fair in Brussels. FDH/LWR is in Beirut, Lebanon, as field engineer for RCA. K7EWZ, ex-8ARO, is a new call at Plains. UZN is going to school at Tucson, Ariz. K7BPF moved from Plentywood to

(Continued on page 156)

"HAM-M" BY CDR

America's most popular ham antenna rotor



Preferred because:

EXTRA HEAVY-DUTY

Holds heaviest commercial arrays — ice-proof, wind-proof, moisture-proof!

WON'T DRIFT

Provides 3500 in.-lb. resistance to lateral thrust.

EASIEST TO INSTALL

It's complete! Mounts on shaft or flat on plate in 30-minutes.

CONTROL CABINET: Pin-point calibrated in 5° units. Needle operates without activating rotor. Built for 8-wire cable.

ROTOR MECHANISM streamlined to resist moisture, "ice-lock." Actually stronger than your antenna itself. 98 ball bearings for smooth action. Positive brake ends drift.

YOU CAN'T AFFORD LESS! WHY PAY MORE? In only a few months the new CDR "Ham-M" Rotor has become the "pet" of hams from Coast to Coast. Costs less than rotors that won't give you any better performance, won't hold heavier antennae, won't give you any more resistance to the elements. It's the complete rotational system—no extras to buy. At your distributor's: only $119.50!

EXCLUSIVE OFFER: CDR "CALL-LETTERS" JEWELRY FREE! Handsome rhodium-finish tie-bar and key chain, both with your call-letters engraved FREE with your purchase of the "HAM-M". Both bear amateur radio emblem. Just *examine* the "HAM-M" and get both for only $3.60 (tax included) a $7.20 value for half price. See your CDR distributor for details.

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HAM ANTENNA ROTOR

Cornell-Dubilier Electric Corp., South Plainfield, N. J.

The Radiart Corporation, Indianapolis, Ind.

VHF from Hy-gain
Easy Assembly • Easy Operation

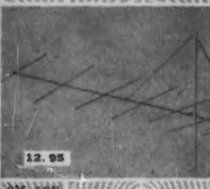
6 METERS

6M, 5E
9 db Forward Gain
Net wt. 9 lbs.
Boom length: 9 ft.
$15.95

6M, 8E
12 db Forward Gain
Net wt. 16 lbs.
Boom length: 18 ft.
$26.95

New pre-calibrated (Gammatrix) Gamma Match assembly with coaxially formed reactance cancelling capacitor—built for 50 ohms—is possible for the first time a perfect 1:1 SWR. Coax connector for 52 ohm feed included.

2 METERS



2M, 10E
13.4 db Forward Gain
Net wt. 11½ lbs.
Boom length: 16 ft.
$12.95

2M, 5E
9 db Forward Gain
Net wt. 4½ lbs.
Boom length: 6 ft.
$6.95

All Hy-gain 2M beams incorporate the Gammatrix dipole matching system. Perfect 200 ohm match for 300 low-loss parallel line or 52 ohm coax. Uses a half-wave balun. Instructions included for matching 72 ohm coax, 300 & 450 ohm balanced lines. All but 1¼M beams use ratio dipole adjusted for perfect match to 300 ohm low-loss open-wire lines.

1¼ M

1¼M, 11E
14.1 db Forward Gain
Net wt. 7 lbs.
Boom length: 12 ft.
$10.95

¾ M

¾M, 15E
16.1 db Forward Gain
Net wt. 7½ lbs.
Boom length: 8 ft.
$9.95

2 & 6 M's

VHF VERTICAL
A new decoupling sleeve principal makes possible low SWR ¼ wave response maintaining efficient operation for the 2 and 6 meter bands. Overall height 5' 52 ohm coax feed. Net weight 3½ oz. Complete with 2 band trapped ground plane and nylon guy lines. Insulator assembly.
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RADIO, INC.
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PASADENA, CALIFORNIA

"Complete Line of Ham Gear"

Rock Springs, Wyo. FTO built a new ham shack and is back on the air from his home station after an absence of 3½ years. ENO has a new SX-101. VLZ has a new 75A-4 and a KWS-1. K7BND and K7CZQ have a new Apache. ZCO has a new Apache. K7AZH got two deer with a bow and arrow. New officers of the Central Montana Radio Club are HFZ, pres.; FTO and WSE, vice-pres.; QYA, secy.-treas.; and NXZ, training officer. New officers of the Harlo Radio Club are K7AZH, pres.; YTG, vice-pres.; TGM, secy.-treas.; and NPV, act. mgr. Traffic: K7BYC 61, EWZ 31, W7SFK 17, EKB 11, DEO 9, K7BVO 5, BON 3, W7CQC 3, NPV 3, K7DVZ 2, W7EWR 1.

OREGON—SCM, Hubert R. McNally, W7JDX—Things are picking up on OSN with three new members, BDU, ZB and K7AZB. OSN is looking for a liaison station on OEN, someone who can work c.w. and contact OSN for traffic. K7ABX is quite active in the Tillamook Area with a nice station layout. PQJ is back at the old stand as OO with a fine report. YKT finally come up for air. Hope you will become active again, Dave. WNV has a new 55-ft. vertical for all bands and should be making a lot of noise soon. GWB still is very active on 6 meters with AREC and RACES. RACES has been issuing some new gear around Portland for c.d. work and several of the gang have new mobile outfits, including GLZ. The C.D. Net meets regularly each Sun. at 1900. The Council of Radio Clubs in Portland is making plans for a National Convention in 1962 which will conform to the building of the new ER Center in Portland; also plans are being worked on for a meeting place for all ham clubs. The Columbia River V.H.F. Society has been formed with RGS as pres. and GLZ as secy. This is a 6-meter club with quite a few members and is showing a good form of activity. A good score was made from the top of Mt. Scott in the V.H.F. Contest. Your SCM would like news from phone members as nothing was received for the month of September. Traffic: W7LT 87, ZFH 56, AJN 29, BDU 28, BVH 28, OMO 24, ALG 19.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—New officers of the Cascade Radio Club of Everett are DKV, pres.; PTX, vice-pres.; BLS, treas.; PRY, secy.; BLX, EIK, PSY, CSK and PZC, trustees. KN7GCK is a new Novice from the Seattle Area. The Washington Amateur Radio Traffic System's (WARTS) new net time is 1800 PST Mon. through Sat. (3970 kc.). Ex-W7CJO now is signing KL7CVI. NMF is building mobile for a new car. HDT is mighty happy with the new HRO-60. ETD is planning a new cubicle quad for 15 meters. HLC now is located near Medical Lake. LVB is back from vacation and sporting a new Ranger. BXH lost his antenna in a wind storm. CWN is thinking of going on 6 meters and also hopes to get mobile in the car for 10 meters. FIX reports his activity is mostly with MARS and PANN with lots of listening. GSP is working on an all-band transmitter. EQU reports five drills were held in the Spokane Area during the month. JEY is very QRL teaching. AIB says his new tower, beam and rotator are already for assembly when he comes back from vacation. WN7EML now is General Class. K7FAL turned in his Technician's ticket on General Class. K7DEK has a new Viking Ranger. W7LHL is on 2-meter s.s.b. ETX joined the ranks of Silent Keys Sept. 4. FD now is working for the Seattle Radio Supply. BA is slacking off on traffic. New or renewed appointments went to AVM as EC, G8P and JWE as OPSs, FQD as ORS. YFO holds skeds with his son, who is KR6IO on Okinawa. WN7BFI has a new 40-ft. tower. NNF has a new Johnson 500. HNT, ex-MARS operator from K7FAE, now is stationed in Spain and planning on a DX-pedition. The North Seattle Amateur Radio Club now meets in new quarters at Shearwater Community Hall. ROH is moving to Centralia AMC. VKZ and ZEQ joined the Navy. HLM moved to Utah. PN has a new receiver. PGY is building a new converter with AFSK for 2-meter RTTY. Officers of the Lower Yakima Valley Radio Amateurs, Inc., are ACA, pres.; KN7OUA, vice-pres.; DOP, secy. All appointees are urged to check the expiration date on their appointments and to renew same if expired. IEU reports the new c.w. net on 3700 kc. is off to a good start. Traffic: (Sept.) W7BA 1211, PGY 696, QLH 353, DZX 250, APS 110, EHH 44, AMC 42, AIB 39, IEU 24, NWP 20, LFA 16, UWT 12, LVB 5, JC 4, G8P 3, CWN 2, JEY 1. (Aug.) W7WQD 21.

PACIFIC DIVISION

NEVADA—SCM, C. A. Rhines, W7VIU—SEC: W7JU. Glad to be your new SCM and hope to meet many of you in person and on the air. I want to get a Nevada State Net going and would like to hear from all interested with suggestions. The latest

(Continued on page 158)

New MORADCO

SINGLE SIDEBAND MINIATURIZED 50 WATT TRANSMITTER

4⅛" x 11-⅞" x 7¼"

Model SBT for Fixed or Mobile Use

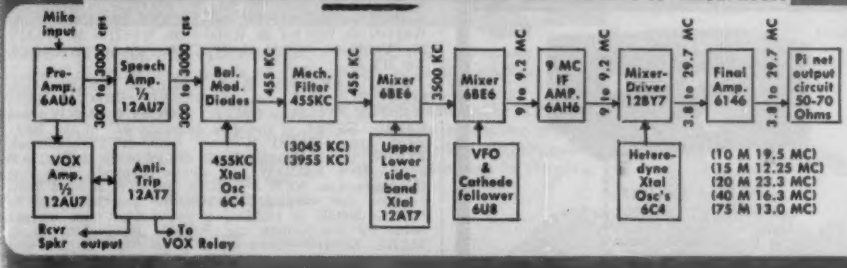
Coverage: 3.8-4.0, 7.1-7.3, 14.1-14.3, 21.200-21.400, 28.5-28.7 MC.

Calibration: VFO Calibrated, 0-200 Kc (add to frequency shown on band switch).

Filter: Uses a Mechanical Filter for Long Term Maximum Suppression of Unwanted Sideband.

Emission: Upper or Lower Sideband. CW-AM (SSB with Carrier Added).

STREAMLINE DESIGN PROVES MONTHS OF MORROW RESEARCH



- Change bands, set drive and peak final, null carrier in about 30 seconds.
- Excellent voice-operated control system (VOX). Anti-trip of new, improved design, plus push-to-talk.
- Semi-automatic loading when changing bands —designed for 50-70 ohms.
- Antenna (VOX) relay built in.
- By changing plugs in the universal power supply unit, the SBT operates as an exciter at about 10 watts output, or as a barefoot transmitter at about 50 watts output.
- Controls grouped for ease of operation.
- Same cabinet dimensions as MB6 and MB565: 4⅛" x 11⅞" x 7¼".
- Plug-in connections for easy removal from car.

NEW

12-Volt DC, 115-Volt AC, Universal Power Supply Unit designed especially for the SBT Transmitter includes complete set of power cables for either home or mobile use.

Amateur net.....**$124.50**

AVAILABLE IN FEBRUARY, 1959.....NET $349.50

FOR FURTHER INFORMATION on the SBT Transmitter, see your dealer or write to:

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P. O. Box 1627 Salem, Oregon

GENESEE

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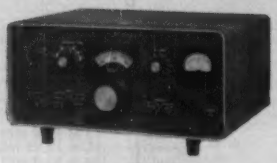
Collins S/LINE

SSB STATION

32S-1 TRANSMITTER

175 Watts PEP Input • 80 through 10 meters
10 db RF Feedback
Automatic Load Control • Upper and Lower SSB, CW
6⅞" H, 14½" W, 12" D

Net Price..... $590.00



75S-1 RECEIVER

Sensitivity — 1 uv for 10 db S/N
Upper and Lower SSB, AM, CW
Broad Position for AM
Crystal Calibrator
2.1 (furnished) and .5 kc Mechanical Filter
6⅞" H, 14½" W, 11⅜" D

Net Price..... $495.00

30S-1 LINEAR AMPLIFIER

(Coming Soon)
Maximum legal power on SSB
1 kw input on CW
ALC voltage fed back to 32S-1 or KWM-1
RF feedback for excellent linearity
Self contained unit, with power supply in lower part of floor mounted cabinet.

Complete line of all Collins equipment and accessories. Trade-ins, time payment plan. Place your order now for early delivery.

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1412 Main St., NIAGARA FALLS, N. Y.

Call Book shows 377 licensees in Nevada. How many are ARRL? We have 23 AREC members and could use more. We need ECs. Write if interested. Address me at Box 1025, Elko. JU still is holding weekly 144-Mc. skeds with the Coast. KOI has a new vertical. UPS may be transferred to Wendover. PEW transferred to Reno. VIU received the W-Conn Award, is awaiting DXCC, is back on RN6 and is on TCC handling traffic. K7ARV is having antenna troubles. AHA joined the ARRL and has an all-band trap doublet. EBJ moved from Reno to Elko and soon will be married. Get your reports in by the 4th so I can have some news for this column. Look me up at 810 Front St. in Elko. Traffic: W7VIU 121.

SANTA CLARA VALLEY—SCM, G. Donald Eberlein, W6YHM—Asst. SCM: Roy E. Pinkham, W6BPT. SEC: W6NVO. PAM: W6ZLO. RM: K6PQH. Your SCM would like to thank all of you who have been so good about reporting regularly. His special thanks go to W6BPT, who so capably prepared this column each month as Asst. SCM and kept things going during our numerous periods of absence; to W6NVO, who so faithfully carried the SEC load with a perfect report record to Headquarters; and to outgoing RM W6QMO, whose unselfish efforts brought new life to NCN and have made it one of the outstanding NTS section nets in the West. It has been a real privilege and pleasure to work and serve with you all. With an eye to the future, here's a doff of the hat to your new SCM, K6DYX, and every good wish to him for a successful term. Anyone interested in high-speed traffic skeds will find K6GZ, K6DYX and K6GES on 3750 kc. nightly at 1930 PST. W6QMO reports a successful campaign to raise a Braille mill for K6YBV. K6VJI is constructing a flying spot scanner and holding traffic skeds with KG6AAY. K6TNM is back on 6 meters with an 829-B transmitter and a Filter King converter. K6IEE and K6MPN are sporting 8X-101s. EC W6DEF reports c.d. base stations W6WWJ and K6OTR now are tied into NTS through himself and K6EWY. New appointments: K6PQH as RM; K6OSX as OPS; K6PQG as ORS. Renewals K6ALH as OO; W6QIE as EC. ARRL Asst. Gen. Mgr. John Huntoon discussed the coming Geneva Conference at the Oct. 13 SCCARA meeting. Traffic: (Sept.) K6DYX 443, K6GZ 404, W6PLG 265, W6QMO 226, W6BPT 153, K6HGV/6 129, W6RFF 84, K6PQH 82, K6PQG 76, W6FON 73, W6YBV 59, W6DEF 39, W6YHM 39, W6AIT 30, W6OII 18, K6VJI 17, W6ZLO 6. (Aug.) W6OII 53, K6CHY 37.

EAST BAY—SCM, B. W. Southwell, W6OJW—Asst. SCM: Mary E. Lorenz, W6PIR. SEC: W6CAN. ECs: W6LGW, W6ZZF, W6IUZ, K6EDN, K6JNW and K6QZG. K6TKL is the new Assistant EC of the Hayward Area. W6ASJ is busy with RTTY bulletins. K6IGN, the Richmond High School club station, has 5 operators. K6DMW has a new Central Electronics 10B and is on NCN and RN6. W6AKB is back from vacation and working DX. W6OJW is getting close to DXCC. K6GK is building a power pack and an antenna for the 2-meter rig. K6DMI is checking in on MARS. K6QHC scored 68,980 in the W/VE Test and now has a DX score of 128/64. WV6BKR has 30 states out of 40 contacts. W6FAR skeds his brother W3CU once a week for family news. WV6AFF received his General Class ticket. W6VCG gave an illustrated lecture on diodes and transistors to the E. Bay RC. K6ZWD made the General Class exam. K6PQH is the new manager of NCN. W6SWP has been discharged from Oak Knoll Hospital. W6PIR is newly married. WA6CAM is a new General Class licensee. K6RPZ has a new KWS-1. K6JAY is mobiling. K6KWX is selling the station and moving to Idaho. K6IRB has a new S-53 and a ground plane. K6AQ has his modified BC-1068 perking on 2 meters. W6IEH bought a 6-meter converter at the MDARC auction. W6OHR won September's MDARC hidden transmitter hunt. K6KYT is operating at ON4UB, Worlds Fair Station in Brussels. K6JES, K6LLM and K6TNA are back at Cal. Poly School. W6CMG now has 94 for DXCC. K6JPR has worked KH6, ZL, KR6 and VK on RTTY. K6OGT is building a new rig. W6IIF talked on the HARC about 'scopes. W6SWY has a new Triband beam. The XYL of K6YAF is recovering nicely from an auto accident. W6KEK now has a DX score of 215/205. K6RZR is NCS on the Silverado Six Shooters Net. W6WLW is on s.s.b. on 20 meters with a kw. and skeds Okinawa. K6BBU and K6BYQ operated portable on Mt. St. Helena during the V.H.F. Party but QRM from W6KOX/6 was too much. K6QXY is a new OES in Crockett, has a new 6-meter rig with 120 watts and skeds K6OFF nightly. I wish to take this opportunity to wish you all a Merry Christmas and a Happy New Year. Good hunting! Traffic: (Sept.) K6GK 240, K6DMW 100, K6QHC 55, W6JOH 31, W6ASJ 14, K6OSO 7, K6DMI 2. (Aug.) K6DMW 67.

(Continued on page 160)

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TWO-WAY RADIO

communications equipment

VHF-FM FOR:
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COMCO'S ALL NEW "580 FLEETCOM"

VHF-FM MOBILE RADIO

The new "580" is compact, light weight, has high performance, and features an original concept in Mobile equipment packaging by combining the **control head, speaker, and transistorized power supply** in one small easily mounted case assembly.

FEATURES

★ **HIGH PERFORMANCE . . . meets "split channel" technical requirements, all FCC and FCDA requirements.**

★ **FULL POWER OUTPUT . . . 35 Watts in 25-50 Mcs. 25 Watts in 144-174 Mcs.**

★ **BUILT-IN RELIABILITY...Preproduction Models field tested in 5 states and 3 foreign countries before starting production.**

★ **SMALL AND LIGHT WEIGHT...Chassis in case 13"x9 9/16"x5½". Control-power Supply-Speaker case 5"x5"x3¾". Complete Mobile installations 24 lbs.**

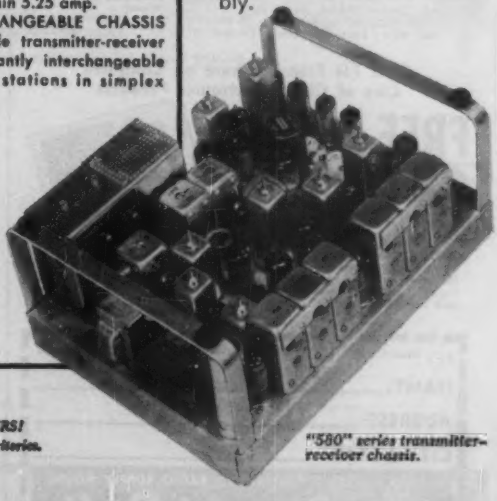
★ **EASY TO INSTALL . . . "Two-unit" package so small most installations are under dash.**

★ **LOW COST . . . Complete mobile package**

$398 f.o.b. factory

★ **EFFICIENT . . . Transistor power supply gives high efficiency. Total standby drain 5.25 amp.**

★ **INTERCHANGEABLE CHASSIS . . . Mobile transmitter-receiver chassis instantly interchangeable with base stations in simplex systems.**



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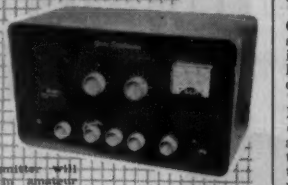

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VOX Model 10

For voice operated control, with extra contacts for auxiliary circuits. Plug in socket at rear of DSB Xmtr. Adaptable for other Xmtrs.

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Kit: $19.95

QT-10:

Accessory for VOX. Wired: $9.95

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SAN FRANCISCO—SCM, Fred H. Laubscher, W6OPL—I want to take this opportunity to wish each and every one of you a joyous holiday season and express my thanks to all for the many kindnesses rendered this office during the year. Our section is growing as the months go by. We have some new appointments: W6FEA is your new SEC; K6OHJ is OO and OPS; W6YOM is ORS; K6SRZ is ORS; W6WJF has taken on the duties of PAM. W6AJF, W6GQA and W6JOX were active in the Sept. V.H.F. QSO Party. Between other activities, W6GQA now checks into three MARS nets. W6GQA enclosed a newspaper clipping of K6AID, showing him pictured with his bicycle on which he vacationed 990 miles to Seattle. The past month found W6YC receiving the following four awards: WAP, WAZL, WAMC and WACC. Gene says DX seems to be improving. The Sonoma radio amateurs have joined in organizing a new defense and disaster network. The new set-up, operating on 75 meters, will give direct contact with San Francisco's new Disaster Center on Twin Peaks. W6GWQ, club president and Santa Rosa C.D. Communications Chief, reported enthusiastic response from his group on recent tests. This section is looking for c.w. operators who would enjoy traffic handling. The following areas in the north need covering: Ukiah, Ft. Bragg, Eureka, Arcata, Crescent City. The Northern California Net (NCN) is part of the National Traffic System (NTS) and welcomes old-timers and newcomers alike. It is on 3635 kc. at 1900 and 2200 PST, Mon.-Sat. Phone operators will enjoy traffic to and from your section by checking in with the Mission Trail Net, 3854 kc., 1900 PST daily, or with the American Legion Net, 3975 kc., 1900 PST daily. Have fun in traffic and be of service to your community by checking into one of these fine nets. W6AWT is busy as usual working the "rare ones." We need more fellows like Moli to help keep the signals clean on the air from clicks and chirps. Even your SCM has finally passed the AWT key-click test. Hi! W6URA is recovering from an operation. The Tamalpais RC is planning some unusually intersting meetings. The San Francisco RC had one of the most active years in the club's history. By the time this report has gone to print, Harry Witzke, 8FRC treas., should have received his amateur call. Congrats, Harry, we all wish you much pleasure in your adventure into the spectrum. The Far West RC still is engaged in completing its club station. The Marin RC has been receiving much newspaper publicity describing its outstanding emergency program. The SF Naval Shipyard RC is actively engaged in operations at its FB layout. The Cathay RC is planning to remodel its club house. Traffic: K6LCF 15, W6GCV 11, W6GGC 8, W6BIP 6, W6OPL 5, W6GQA 2.

SACRAMENTO VALLEY—SCM, LeVaughn Shipley, K6CFF—The TVI Committee of Sacramento has had quite a struggle for the past few months but we are happy to announce its survival. K6ORT reports that his son Tom is now KN6LVN. W6LTN and his XYL W6LTG are off to England for 3 years. W8USB/6, industrial arts professor at the Chico State College, and K6YOE "ham it up" almost every evening on 75 meters. K6MYL is on the active list again. Sacramento welcomes W6ZNU, who comes to us from Chico. W6FOD has just returned from Santa Cruz and reports that receiving conditions are very poor in that area. Hi! K6HDE is the new EC for Marysville. We'll miss hearing K6LGU while he is attending the University of California at Davis. W6PYE sent in confirmation for his DXCC. Congratulations to K6JJQ, who has a new license and is on phone for the first time. The new officers of the Tehama County Amateur Radio Club are K6RFT, pres.; K6IRFD, vice-pres.; and K6SKG secy. K6YBV is a new asst. mgr. of RN6. W6QYX is having so much fun with 10 watts that he can't figure out what high power is for. W6ZF, our Vice-Director, transmits the Pacific Division Bulletins on the 2nd and 4th Mon. at 8 P.M. on 3540 kc. Traffic: K6YBV 875, W6ZF 11.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—I would like to apologize to the Bakersfield Area. I do have a fan down there, K6SWR. Many thanks for the news. W6GFZ has moved to Visalia from Arvin. W6NXT has a new mobile rig and is having a ball. The Bakersfield Radio Club meets the 2nd and 3rd Fri. of each month in the Bakersfield Police Building. W6PCZ has moved to Fresno. W6EUH is back in college in Modesto. W6AJE is getting his gear back into shape for the winter. W6PPO's new QTH is 1015 W. Alamos, Fresno. W6TTX got married in September. Congratulations. W6JXY has an HRO-60 receiver. W6NTV, in Turlock, is looking for contacts on 432 Mc. W6PRU has a Gonset Communicator III and is mobile on 6 meters. The Fresno Radio Amateur Radio Club code class is going along very

(Continued on page 163)

Transistor Power Supplies* and Components

*Complete Units

D SERIES (Standard)

Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at ½ selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap.

Size: 4⅜" x 3⅛" x 1⅛" Wt.: 10 oz. 6- or 12-V Input: **$39.95** 24-V Input: **$61.95**

DA SERIES

Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermittent duty to 90 watts, 450 volts at 150 MA; 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided.

Size: 4⅜" x 3¼" x 1⅛" Wt.: 14 oz 12-V Input: **$57.50** 24-V Input: **$79.50**

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H-14-450-12 Input: 12/14-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...55 watts.

H-28-450-13 Input: 24/28-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...65 watts.

H-6-100-125-150-D Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.

H-12-100-125-150-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.

H-24-100-125-150-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA.

Without Encapsulation (2 ozs.). 1-10 units: **$16.00** ea. With Encapsulation (3 ozs.). 1-10 units: **$18.50** ea.

HD SERIES — 2000 CPS

HD-14-225-300-2-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

HD-28-225-300-2-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$18.50** ea.

With Encapsulation (4½ ozs.). 1-10 units: **$21.50** ea.

HDS SERIES — 2000 CPS

HDS-14-225-300-3-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

HDS-28-225-300-3-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$21.50** ea.

With Encapsulation (4½ ozs.). 1-10 units: **$24.50** ea.

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14-115-1.5-400 Input: 12/14-VDC. Output: 115-V at 1.5 amp.

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Dim: 3" dia. x 1" thick. Without Encapsulation (12 ozs.). With Encapsulation (16 ozs.). Per Unit: **$76.00**.

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12/14-V operation—**$11.00** per pr.

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nicely with about 20 students wanting their tickets. W6PSQ and K6BKZ are in charge. W6NTV has a 100-ft. tower with an antenna on 432 Mc. W6DUD and K6OGX went up to Mt. Pinos during the V.H.F. Sweepstakes and made lots of contacts. W6NAS has a Triband beam on a telescoping tower. W6PXP has a Gonset receiver for his mobile rig. W6NKZ got the bugs out of his powerful 10 watts on 75-meter mobile. K6VWF is heard on 75-meter mobile. K6QOK is building a new final using an 813 on 40 meters. Anyone interested in an ORS appiontment? Traffic: (Sept.) W6ADB 82, K6RLX 6, W6ARE 4, K6SNA 3. (Aug.) K6SNA 2.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL. PAM: DRC. V.H.F. PAM: ACY. The NCN has been reactivated, thanks to BAW. Space limits these section reports, so please be patient. The Tar Heel Emergency Net met the challenge of "Helene." The net was activated at 1930 Sept. 26 on a "watch" basis. LCV, CVU, WSS and RRH copied the Miami Weather Station on RTTY and passed information along to the various nets. At 0658 Sept. 27 a state of emergency was declared in Area No. 3. (3865 kc.) TJA established an Information Net on 3855 kc. Both nets were closed at 2318 Sept. 28. The following operators handled the nets: K4DHV, EYZ, K4CAU, TJA, ZKE, K4DWX, K4LWL, AWH, K4IEV, WSS, HUW, HUL and DCQ. BAW reports that he logged 250 stations and handled 63 formal messages and 68 informal messages. Al spent 38 hours on duty with 1¼ hours on emergency power. LXH, of Alamance County, reports his AREC-RACES group was set up and ready to go. There may have been other AREC-RACES groups but no other reports have been received. MARS was activated with K4WDF acting as liaison station to handle traffic to the Red Cross, Third U.S. Army and to states outside North Carolina. Amateurs who are also MARS members and who acted as NCSs on 5760 kc.: AAH6CBF, A4AMY and A4RRH. All communications services were used. RACES joined with the Tar Heel Net. CAP and the highway facilities were used.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. RM: AKC. PAM: YOS. Hurricana Helene and the S.E.T. gave members of all three nets a good workout. The participation by net members and the discipline were gratifying. The panel discussions by net members and net managers on Oct. 11 will do much to coordinate the nets to the advantage of each. K4HQK is a new ORS. K4LEI has completed a 6-meter rig. K4LML has moved to Florida. K4DFR and K4QZA are in Clemson, along with K4BMV. K4CXJ's OM, W2KGO, can be heard on s.s.b. on 14,306 kc. as KA2LT. K4ADD monitors 3930 kc. regularly from Arlington, Va. The chief operator of K4FAI (Burt, K4TMS) departed Nov. 1 for KX6-Land. K4AXV was interviewed on "The Teenage Roundup" during "Helene" on WIS-TV. GCB, HAP, K4AYG and K4GIE are on the air at Clemson with a Collins 75A-2 and a 32V-3. The Aiken Club made a tour of the ham shacks of AIB, KYN and CAL on Sept. 17, following which an auction was held for the benefit of the club. Traffic: K4WCZ 200, W4AKC 103, K4AVU 103, BVX 75, W4PED 63, DAW 48, K4BLF 43, W4CHD 32, CJD 32, K4GAT 28, W4BHR 24, K4IIE 23, K6RUO/4 14, K4PIK 10.

VIRGINIA—SCM, John Carl Morgan, W4KX—VN and VFN were both alerted and ready during Hurricane Helene, which fortunately avoided Virginia. K4MJZ reports fine official cooperation with the AREC by the Arlington Red Cross and Police, with several hams being furnished emergency generators. K4QIX's XYL is now KN4AJL; CHK's dad and sister are KN4SAB and SAF, who await Conditional class tickets; KN4AJJ, new in Winchester, is the son of the late NLT. Collegiates: VQZ at M.I.T.; K4MBL and K4BYS at U. of Va.; TVI and K4HJZ at N.C. State; CXQ, K5BUI and K4IIQ at V.P.I.; UHG at Hampden-Sydney; YZC at Wake Forest; PVA slaving nights at G.W.U. The SVARC again assisted with the Winchester Lions Broom Sale. OOL says 2-meter activity is booming in the Valley Area; as also is the case in the Tidewater Area, according to ZPE. K4KWW and 8YW operated Danville ARC's CB during the V.H.F. Party. The Hampton Roads ARC is sponsoring a Half-DXCC Award for Novices, with certificates No. 1 going to KN5LZO. PRO reports a ham demonstration at Langley AFB by 3IWN/4, K4KTR and KN4SBK. K4PAO reports a 75-meter morning net of radio-TV servicemen every week day at 0700 on 3805 kc. Sixty-nine logs of "Va. Free For All" participants were received by the SCM by the deadline. Winners will receive certificates and results will be sent QNC on VN, VFN and VSN.

(Continued on page 164)

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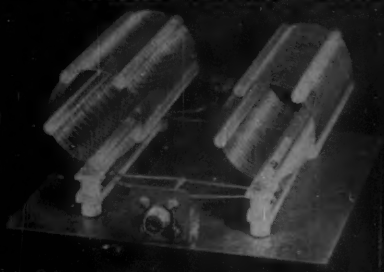

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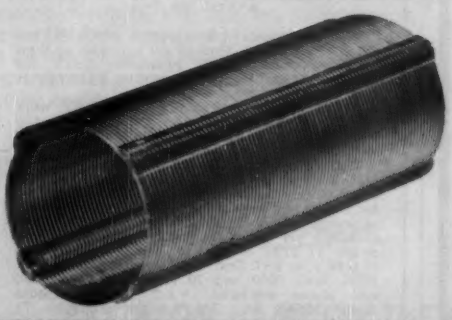

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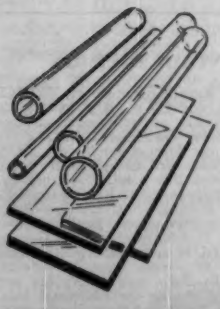

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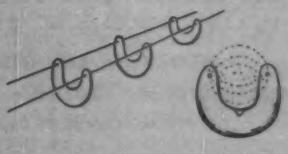

½" spaced open-wire transmission line. Solid copper wire with pure silver sheath and FORMVAR coated. Exclusive OUT-FIELD spacer cuts losses by keeping dirt and moisture out of maximum field. The ideal LADDER LINE® for all RF frequencies. Other types of LADDER LINE® are also available... Price 6.3 cents per foot.

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All Virginians are urged to participate in any or all of these nets: VN, 1900 EST daily and VSN 1830 M-F, both on 3680 kc. and VFN, 1900 daily on 3835 kc. No special invitation is required and all are welcome. Traffic: (Sept.) W4PFC 630, K4EZL 613, ELG 568, QIX 520, W4QDY 333, K4KNP 254, W4SHJ 234, K4JKK 191, QES 171, W4BZE 135, K4DSD 78, W4RHA 57, EMH 37, CVO 30, KX 30, UHG 19, K4QER 18, EIG 14, W4LW 10, K4IIP 8, KDJ 8, W4SNH 8, CXQ 7, OOL 7, K4LEF 4, MJZ 4. (Aug.) W4PVA 134.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—SEC: HZA. PAM: GAD. RMs: GBF, FNI, PBO and VYR. V.H.F. PAM: K8IYQ. The W. Va. Worked All County and Worked W. Va. Awards are creating much interest both in and out of the State. The fellows who are spending a lot of their time operating mobile in the rare counties are certainly to be complimented. The SEC is interested in increasing the AREC membership and EC appointments in counties which are not presently signed up. If interested, please apply to HZA. QWE has a new Ranger and is in a new QTH at Clendenin. Ex-UEN is now K2PDA. S8A is very QRL. VAN is on s.s.b. in Charleston. CRM is now at Alderson-Broaddus College. KLI is mobile. C8G is getting ready for 10-meter fall activity. K8HAI, KN8LGU and the XYL of K8BIT (awaiting her General Class ticket) appeared on a 15-minute TV program in Charleston and discussed ham radio. K8IYU is the new V.H.F. PAM. The slow-speed net on 3570 kc. daily at 1800 EST has very good participation. HRO, DFO, KNC and FNI participated in the last V.H.F. Party. The Weather Net is doing a fine job. JNX, CAY, IYU and K8HRO attended the Cincinnati Hamfest. DDB has his receiver back from the factory after being repaired. HID is building a new 814 final. JUE is a new ORS. Traffic: (Sept.) W8PBO 103, K8HID 77, W8VYR 63, HZA 45, BWK 34, K8CNB 28, W8DFC 14, PQQ 9, K8CSG 6, HRO 2, JFF 2, W8QWE 2. (Aug.) W8BWK 24, K8CRM 6.

WEST VIRGINIA QSO PARTY

December 6-7

To aid amateurs in their pursuit of the Worked West Virginia and Worked All Counties in West Virginia awards (p. 63, September *QST*), the Kanawha Radio Club is sponsoring a QSO party to be held December 6 and 7.

Rules: 1) Stations outside W.Va. will work as many W.Va. amateurs as possible, using any band or mode. Outside stations will call "CQ WVA." West Virginia stations will sign "WVA" after their call. 2) Each contact will contain a QSO number, RS or RST report, and state or country. 3) Stations may be worked once on each band and may be worked on as many bands as desired. 4) Score one point for a complete QSO exchange *per band*. Incomplete contacts do not count. 5) Time of contest: 6 P.M. EST Dec. 6 to 6:00 P.M. EST Dec. 7. 6) Suggest frequencies: 3570, 3890, 7050 and 20 kc. inside each band and phone sub-band. V.h.f. stations should check 50.760 Mc. for 6-meter contacts. 7) Awards will be presented to the top scorer in each state or country. Amateurs in W.Va. will be given awards for first, second, and third place. 8) Logs should be submitted to Contest Committee, Kanawha Radio Club, Box 129, Spring Hill Station, South Charleston, W.Va. 9) Decisions of the judges will be final.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, B. Eugene Spoonemore, W9DML—SEC: NIT. PAMs: IJR and CXW. KQD visited in Iowa. The Montrose Club has an outstanding traffic-handling group. K9LSL won the June V.H.F. Party technician award. The Denver Area group is very active on 6 meters; there are 40 members and plans are being made for transmitter hunts on this band. The group recently held a picnic with fifty present. K9JSR conducts theory classes each Fri. evening. The Western Slope Radio Club held its Annual Picnic Sept. 21. The Coffee Club gang held its Annual Hamboree at Poncha Springs Sept. 13 and 14. K9DXF, DDM and Ruth did the main planning and there were 50 present from 15 different towns. K9HEH, CEZ, IYE, W9IA and RRV, the new publishers of the *Bark*, are looking for additional help. K9LZF is the new editor of the El Paso Radio Club

(Continued on page 166)

"THE BOSS"... O. L. (Roy) Dewey, W1GWD. As Manager of Raytheon's Government Services Division, Roy Dewey is boss of the division's field engineers stationed around the globe. Here, in his well ordered shack, he relaxes as he talks to the Raytheon gang during a net session.

"THE SHIRT"... Al Robbins, KH6CBA. You'd be wearing something like this, too, as Raytheon's senior field engineer in old Hawaii. Al and many of the other hams in Raytheon's field engineering organization keep in touch with each other during weekly skeds on 20, 40 and 80 meters.

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RAYTHEON HAMS ON THE WAY UP KEEP IN TOUCH WITH THE BOSS THRU DX SKEDS

Many of Raytheon's field engineers are hams. From division manager, Roy Dewey, W1GWD, in Greater Boston, across the country and the Pacific to Al Robbins, KH6CBA, senior engineer, you'll find them burning up the airwaves around the clock.

Ham radio electronic experience has helped many engineers advance within the company.

You may qualify as a Raytheon field engineer if you have previous experience plus an E.E. degree or the equivalent in practical experience with guided missiles, fire control, ground and bombing radar, sonar or radar countermeasures.

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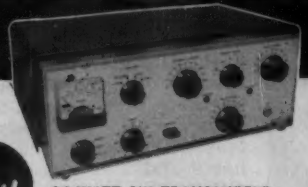

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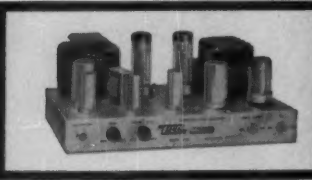
Conservative, highly efficient design plus stability, safety, and excellent parts quality. 80 thru 40, 20, 15, 11, 10 meters (popular operating bands) with one knob band-switching. 6146 final amplifier for full "clean" 90 W input, protected by clamper tube. 6CL6 Colpitts oscillator, 6AQ5 clamper, 6AQ5 buffer-multiplier, GZ34 rectifier. "Novice limit" calibration on meter keeps novice inside FCC-required 75W limit. No shock hazard at key. Wide range, hi-efficiency pi-network matches antennas 50-1000 ohms, minimizes harmonics. EXT plate mod. terminals for AM phone modulation with 65W input. Excellent as basic exciter to drive a power amplifier stage to max. allowable input of 1KW. Very effective TVI suppression. Ingenious new "low silhouette" design for complete shielding and "living room" attractiveness. Conservatively rated parts, copper-plated chassis, ceramic switch insulation. 5" H, 15" W, 9½" D.



NEW UNIVERSAL MODULATOR-DRIVER #730
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Superb, truly versatile modulator at low cost. Can deliver 50 W of undistorted audio signal for phone operation, more than sufficient to modulate 100% EICO #720 CW Transmitter or any xmitter whose RF amplifier has plate input power of up to 100W. Multi-match output xmfr matches most loads between 500-10,000 ohms. Unique over-modulation indicator permits easy monitoring, no need for plate meter. Lo-level speech clipping & filtering with peak speech freq. range circuitry. Low distortion feedback circuit, premium quality audio power pentodes, indirectly heated rectifier filament. Balance and bias adj. controls. Inputs for xtal or dynamic mikes, etc. Excellent deluxe driver for high-power class B modulation. ECC83/12AX7 speech ampl., 6AL5 speech clipper, 6AN8 ampl. driver, 2-EL34/6CA7 power output, EM84 over-mod. indicator, GZ34 rect. Finest quality, conservatively rated parts, copper-plated chassis. 6" H, 14" W, 8" D.

NEW GRID DIP METER . . . . . #710
KIT $29.95 WIRED $49.95 including complete set of coils for full band coverage.

Exceptionally versatile. Basically a VFO with micro-ammeter in grid; determines freq. of other osc. or tuned circuits; sens. control & phone jack facilitate "zero beat" listening. Excellent absorption wave meter. Ham uses: pretuning & neutralizing xmitters, power indication, locating parasitic osc., antenna adj., correcting TVI, de-bugging with xmitter power off, determining C,L,Q. Servicing uses: alignment of filters, IF's; as sig. or marker gen. Easy to hold & thumb-tune with 1 hand. Continuous 400 kc—250 mc coverage in 7 ranges, pre-wound 0.5% accurate coils. 500 ua meter movement. 6AF4(A) or 6T4 Colpitts osc. Xmtr-operated sel. rect. 2½" H, 2¾" W, 6¾" L. Satin deep-etched aluminum panel, gray wrinkle steel case.

Arrow Electronics, Inc. 65 Cortlandt St. New York 7, N. Y.

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☐ Send FREE CATALOG	☐ #720	☐ Wired	☐ Kit	$..... check or M.O. enclosed.
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News-Letter. At the Annual Denver Hamfest there were five two-letter call members present—W0s IA, IC, LO, PG and TX. WDM/mobile XE is attending school in Old Mexico. KØPSV has a new 15-meter beam. LO, PG, SIN, YHI, VDY, V8N and KØHPF were among those who participated in trying to locate the lost boy near Camp St. Malo. HXP and family vacationed in Illinois, P8X in Nebraska and OEV in Michigan and California. Traffic: (Sept.) WØIA 924, KQD 204, DQN 105, KØEDK 72, WØWME 70, KØDCW 62, WØQOT 54, KØEVG 47, WØTVI 47, NIT 34, KØEDH 28. (Aug.) WØIA 862.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, 7OCX. SEC: FSC. PAM: BBN. V.H.F. PAM: SP. RM: UTM. OCX is the new Vice-Director for the Rocky Mountain Division effective Jan. 1, 1959. K7BHE reports that he has been passing out quite a few QSL cards for the gang on 10 meters who need Utah for WAS. TWN (formerly RMN) is now back on 3750 kc. after spending the summer on 40 meters. FSC, QWH and VFY have erected new poles. CVE, who recently received his General Class ticket, is now on the air with a Viking Valiant and an FB signal. Applications for 1959 call letter license plates should be mailed on or before Dec. 1, 1958. KN7s ELE and GBJ are new Novices in American Fork. 6IQJ was guest speaker at the September UARC meeting. Traffic: W7-JBV 128, OCX 40, QWH 2.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU. V.H.F. PAM: FPB. RM: DWB. The NMEPN meets on 3838 kc. Sun. at 0730 MST and Tue. and Thurs. at 1900 MST. The Breakfast Club meets Mon. through Sat. on 3838 kc. at 0700. The RMN meets Mon. through Fri. on 3570 kc. at 1900 MST. Try to check in on as many of these nets as you can. K7DVB and K5MAP have received RCC from station K5WSP. Albuquerque had a C.D. Alert on Sept. 11, also a drill with c.d. representatives at WNU. ZM, the club station at Roswell, is very active again and in the process of putting up a beam. Your SCM didn't get very much news this month, so how about sending in information on what *you* are doing. At present we have 13 very active ECs in the State. The ECs meet each Sun. on 3980 kc. at 1900 MST. Anyone wishing to listen or check is welcome to do so. The purpose of the net is for the ECs to get together with the SEC and SCM. Traffic: K5WSP 1014, FHU 957, LWN 17, MRP/5 17, W5GD 10, K5DAA 8, DAB 8, W5FHL 7, WNU 6, VC 5, CIN 4, K5GYZ 4, W5ZU 4, KN5PRR 2, K5IQL 1.

WYOMING—SCM, Lial D. Branson, W7AMU—The Pony Express Net meets every Sun. at 0830. The YO Net meets Wed. evenings on 3610 kc. AEC is a new grandpa. NVX has a new beam up and works lots of DX. DTD is on a vacation trip South. SZZ reinforced the beam and is working DX. K5DDG/7, of Laramie, has a new call, K7DDG. There are a lot of our hams down at Wyoming University, Laramie. LVU, XYM and AMU are holding schedules on 2 meters. There seems to be prospects of more 2-meter rigs. QPP, Sheridan, reports progress is good in next year's hamfest arrangements. A new 40-meter net called the Jackalope Net is operating on 7255 kc. at noon. Traffic: W7YXM 5, DW 4, BKI 3, CQL 3, AEC 2, AMU 2, CSW 2, DTD 2, VHP/7 1.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, jr., W4HKK—SEC: EBD. PAMs: DGH and K4BTO. RM: RLG. Congratulations to K4GBO on being elected the outstanding NCS of AENP for the third quarter of this year. Welcome to another new EC, FDD, who will handle Chilton County. Another new one to help you make YLCC is K4ZXZ, in Tuscaloosa. The code and theory classes of the Tuscaloosa Club started Oct. 2. New appointees are K4PHH and KAK as OPSs and GZM as OES. EW continues active on 2 meters from Montgomery. K4SSB is active in most contests. K4PHH is building a new shack and with his XYL K4TDJ is working 10 and 20 meters with a new beam. New clubs have been formed in Troy and Greenville. Those interested in joining may receive details from the SCM. A group in the Huntsville Area are working on 1215 Mc. equipment and the Birmingham group has a TV project going. Please send news or articles and pictures for the section bulletin to Howard Kirkpatrick, WAZ, 1135 Jackson Highway, Florence, Ala. Traffic: W4RLG 401, PVG 46, DGH 34, K4BTO 32, JDA 19, W4CIU 18, K4POZ 17, W4MI 13, K4KBT 12, AOZ 10, JBW 9, 88B 9, PHH 8, HJM 8, KJD 5, W4WAZ 3, HKK 2, K4KAK 2.

EASTERN FLORIDA—SCM, John F. Porter, W4KGJ—SEC: IYT. RM: K4SJH. PAMs: TAS and RMU. Section nets: FPTN, 3945 kc. at 0700 Mon. through Sat.; FMTN, 7230 kc. 12 noon Mon. through Sat.; TPTN, 3945 kc. 1730 daily; FN, 3675 kc. 1900 Mon. through Sat.; GN, 7105 kc. Mon. through Sat., fast session 0900 to 1000 and slow session 1000 to 1130: FEPN, 3910

(Continued on page 168)

HEAVY DUTY
MOBILE BASE MOUNTS

NEW!

MMW-3AE MMW-3APS

Engineered for Greater Performance

The last word in modern design for strength and service in universal swivel bases. Easy installation, mounts watertight on any surface. With template. Positive locking, any position.

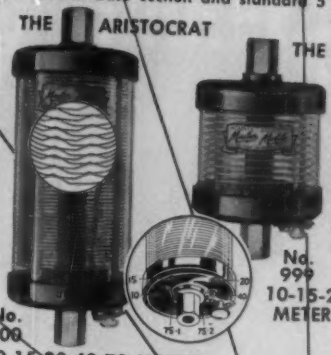
Ebony Finish $6.95 Polished Finish $7.95
Ebony Finish, S. S. Hardware $8.95
Polished Finish. S. S. Hardware $9.25

NEW MULTI-BAND ANTENNA COILS

New Plug-In type coils for the Ham, designed to operate with a standard 3' base section and standard 5' whip

THE ARISTOCRAT

THE VICTORY



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- Handles 500 Watts input
- Operates into a 52-ohm cable
- Positive contact—noisefree, troublefree operation
- Weathersealed
- Factory pre-tuned—no adjustments needed

No. 900
10-15-20-40-75 METERS

No. 999
10-15-20 METERS

YOUR CHOICE
Amateur Net
$14.95

Now! 2 New Coils... just plug in and presto! your coil is ready for operation on the desired band! No switches, no sliding contacts, no loose connections. Built and pre-factory tested in Master Mobile's own laboratories.

NEW! from Master Mobile

Leaders in the Design and Manufacturing of **Mobile Communication Equipment & Antennas**

NEW HEAVY DUTY
MOBILE SPRINGS

MMW-7 MMW-7SS

PROTECTS YOUR MOBILE ANTENNA

Heavy duty flexible mounting spring mounts on the base and holds the antenna. Special flexible "give" spring prevents sharp impacts and breakage. Lockwashers included.

MMW-7 Cad. plated, black painted ends $4.50
MMW-7HC Heavy Cad. plated—Extra Protection $5.50
MMW-7SS Deluxe Stain. Steel $8.95

No. 321 BODY MOUNT

Swivel base body mount, less spring. Specially constructed diagonal ball joint for maximum strength. Amateur Net $7.95

NEW! SLIM-JIM
ALL-BAND BASE LOADING ANTENNA COIL

FOR 10 11 12 15 20 40 80 METERS

NO. B-1080

Positive action, just slide whip in or out to loading point and lock nut into position. $17.95

Automatically tunes the entire band from the driver's seat!

MASTER MATCHER & FIELD STRENGTH METER
6 or 12 volt models $24.95

BUMPER MOUNTS WITH NEW X-HEAVY DUTY CHAINS

No.444 $17.80 No.445 $7.95 No.446 $13.45

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AT LEADING RADIO JOBBERS EVERYWHERE

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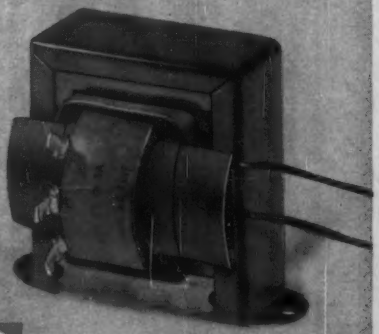

Type	Secondary Volts	Secondary Amperes	Test Volts
F-10U	5.0 CT.	14	10000
F-71U	2.5 CT.	10	10000
F-72Z	2.5 CT.	5	7500

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kc. 1830 Tue. only. K4SJH made BPL in September and K4RZQ and DRO made it in August. WUU has a new HQ-110 and a Lettine transmitter. K4OD8 is the new asst. net manager for FMTN. YOX is the new net manager for GN. MBO is back on with a TBS-50D. K4COO has a new 3-band ground-plane for DX work. LDM and KZT have an all-ham family now with their two kids getting their tickets. BWR is now on 2 meters with a new Gonset III. 3EGJ, at Orlando, now has a new tower up and is maintaining regular skeds with De-Land and Daytona Beach on 6 meters. EHW is set up for emergency work with a new 2.5-kw. power unit. FFF says he can now hear them with his new 75A-4 and work them too with that 4-400A in the final. Lake Wales now has 12 v.h.f. stations on 2 meters. DPD is the spark plug up that way. K4TCM is the new Asst. EC for E. Volusia County. The After School Net, ASN, meets Mon., Wed. and Sat. on 7105 kc. at 1700 EST. K4RZQ, in Citra, is net manager. All teenagers and other students are urged to check in. The Dade Radio Club was presented with the *Florida Skip* Field Day trophy Sept. 2 by IYT, *Skip* editor. AHZ is the new c.d. director for Broward County. ZUT is the new EC for Monroe County. NGR is the new EC for Seminole County. Did you know "Homer" is home from Chattahootchee? Traffic: (Sept.) K4SJH 1354, GPI 405, LCF 212, W4TAS 108, DVR 98, YOX 90, K4BR 88, W4IYT 88, K4RNS 85, COO 74, RZQ 72, AKQ 66, W4LDM 64, K4AHW 63, JCF 45, BLM 44, KDN 44, ILB 38, W4SGY 31, K4ODS 29, W4ZIR 25, BWR 21, K4BNE 16, W4DPD 15, K4-OSQ 15, JJZ 12, W4FFF 11, K4YOQ 11, ANJ 8, IWT 7, W4SJZ 7, W3EGJ 6, W4BJI 5, FJE 5, K4MTP 4, W4-EHW 2. (Aug.) K4DRO 179, W4PJU 175, K4ANJ 5.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: PQW. RMs: AXP and BVE. Pensacola: K4QQO moved to a new QTH. K4RMO worked a DL4 with his 18-watt mobile. AXP continues active in LO Parties. K4ZJF has a new Mohawk and an Apache. K4PIQ has a very neat ham shack and FB antenna farm. HYL has a new Triband beam on a 60-ft. tower to go with the kw. PAA still is Mr. DX in town. RDC and family had a nice trip to Arizona. Panama City: K4OID has been appointed ORS. BVE, NCS of NWFN, has moved to a new QTH in Ft. Walton. K4UBR got 60 contacts and 8 zones in the W-VE Contest. K4PVU reports the Tallahassee 2-Meter C.D. Net still is active. He also is working with the Leon High School Radio Club. K4RZM, Port St. Joe, has appointed K4RZF and K4LQQ as Asst. EC. KN4UPI is a new ham in St. Joe. Hams in Ft. Walton who assisted in parades the Labor Day week end were treated to a fish fry by the Police Department in appreciation for their services. When it appeared that a hurricane was heading this way, Eglin AFB made available 10 emergency power units to members of the 10-meter emergency net. Traffic: K4UBR 336, W4BVE 135, SRK 74, K4OID 56, PVU 24.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: K4AUM. PAMs: LXE and ACH. RM: PIM. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 Sun.; ATLCW on 7150 kc. at 2100 EST Sun.; GSN Mon. through Sat. at 1900 EST on 3595 kc. with PIM as NC; the 75-Meter Mobile Phone Net each Sun. at 1330 EST on 3995 kc. with MV as NC; ATL Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc. with VHW as NC; GTAN Sat. at 1000 EST on 7290 kc.; the GPYL Net Thurs. on 7260 kc. at 0900 EST with K4CYV as NC; the Ga. Novice Net Thurs., Tue. and Sat. at 1800 EST on 7157 kc. with K4HMS as NC; the GAN on 7105 kc. at 1800 EST Mon. through Fri. with K4KZP as net mgr. The GAN Net is now a member of the National Traffic System. GSN still needs more operators. PIM is doing an FB job as NC. Let's check in more often with Jack. K4FBA has a new kw. linear amplifier. K4-LVE and ETD are in a new QTH in Warner Robins. K4KZP made BPL in September. K4OCI has an SX-28 now. K4LEM has a new Knight kit to be used for portable operation also. HYW is doing an FB job as QSL Mgr. Keep him supplied with envelopes. FWH made a trip to Brasstown Bald to operate on 144 Mc. Bad weather conditions hindered operation. IMQ's son is now a Novice, K4AEK. K4AIQ is secy.-treas. for GPYL. The Thomasville, Ga., Radio Club now is reactivated with ZDP, pres.; VBF, vice-pres.; QBG, secy.-treas. KN4-ACT is a new ham in Thomasville. Check your ARRL appointments for renewal dates as they have to be renewed each year. Make sure you are registered with your EC. Traffic: K4FBA 294, LVE 229, W4PIM 200, K4KZP 197, BAI 96, W4BXV 83, K4LEM 11, W4HYW 4.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA. DJ now is using an antenna tuner and an SWR meter on all bands. DJ handled emergency traffic to Washington, D. C., on 40-meter c.w. with W3CDQ. AZ is using a rebuilt BC-610 on 40 meters. RD is on 3925 kc. using a KWS-1 with one sideband and carrier. KP4GN is operating mobile on 75, 40 and 10 meters.

(Continued on page 170)

HARVEY HAS THE HAM GEAR OF THE YEAR

A HARVEY HAM BUY

NEW!
Do-It-Yourself EICO Ham Kits

90-Watt CW Transmitter Model 720

The new EICO Model 720 is a very "clean" 90 watt CW, 80 through 10 meters bandswitching amateur transmitter. Some important design features are: one-knob band switching; tune and operate switch; final amplifier grid drive control without detuning oscillator; oscillator keying for break-in operation, a "novice limit" calibration (75 watts) on the meter.

KIT $79.95 WIRED $119.95

SPECIFICATIONS — Power input: 90 watts CW (novice limit calibration on meter); 65 watts AM-phone with EXT plate modulation. **Output impedance:** 50-1000 ohms. **Band Coverage:** 80, 40, 20, 15, 11, 10 meters. **Operation:** XTAL, EXT. VFO. **Cabinet Size:** 15" wide x 5" high x 9" deep. **Shipping Weight:** 27 lbs.

A HARVEY HAM BUY

GRID DIP METER MODEL 710 — An exceptionally versatile, stable, rugged, compact design. Basically a VFO with a microammeter in its grid circuit, it determines frequency of other oscillators or tuned circuits; has a sensitivity control and phone jack to facilitate "zero beat" listening. Also excellent as an absorption wave meter. Ham uses: pretuning and neutralizing transmitters, power indication, locating parasitic oscillations, antenna adjustment, correcting TVI, general de-bugging with transmitter power off, determining C, L, Q, etc. **KIT $29.95 WIRED $40.95** including complete set of coils for full band coverage.

NEW! SHAKESPEARE — WONDEROD NORMAL MODE HELICAL ANTENNAS. Now — an efficient distributed-load antenna built into a Snakespeare Wonderod! You can mount this shortened antenna on trunk or fender without a spring mount. Glass fibers run the entire length of the whip, with the coil wound inside the lower half fiberglass. The result is superior electrical characteristics and the appearance of a standard whip.

STYLE	62-3	62-4	62-5	62-6	62-7
BAND	10 meters	15 meters	20 meters	40 meters	80 meters
APPROX. LENGTH	4'	4'	6'	6'	6'
PRICE	15.90	15.90	18.75	18.75	18.75

Special 40 and 80 meter bumper mount antennas in 8' lengths — $21.00

A HARVEY HAM BUY

CUSHCRAFT BLITZ BUG — A Coaxial Cable Lightning Arrester

This all new Lightning Arrester, for standard coaxial cable, is designed to eliminate heavy static charge build-up — protecting valuable radio equipment. There is no insertion loss from Blitz Bug; it will not affect performance or S/W/R, to 150 MC. **ONLY $3.95**

OUR 31st YEAR

MAIL ORDERS SHIPPED SAME DAY AS RECEIVED

ESTABLISHED 1927

HARVEY RADIO CO., INC.

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CALLING ALL PHONE MEN AND BRASS POUNDERS

TRADE NOW —GET MORE

FOR YOUR USED GEAR with a WALTER ASHE "SURPRISE" ALLOWANCE

Walter Ashe—Your complete ONE-STOP RADIO SUPERMARKET

specializes in supplying amateur needs —including all necessary parts to build or modify transmitters, receivers and other ham shack equipment!

Here at Walter Ashe we NEED your used equipment—and we're trading extra high to get it! Tell us what brand new 1959 gear you'd like . . . and tell us what you have to trade. You probably won't believe your eyes when you see how much we'll offer! Walter Ashe stocks all the latest releases in home receivers and transmitters . . . plus everything you need in parts, test equipment and High-Fidelity. Select the equipment you want from the new Walter Ashe 1959 catalog. It's packed with everything in Ham Gear from leading manufacturers. Plenty of new SSB units to choose from, too! Buy on liberal payment plan if you wish.

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Dept. Q-12-58 1125 Pine St., St. Louis 1, Mo. In Our 37th Year

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For.....
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AMG raised both 80- and 40-meter antennas and is rebuilding the 400-watt transmitter. KV4BA is accumulating a Lampkin frequency meter and other instruments for marine radio repairs at St. Thomas. KP4DV does marine work in P.R. ACQ, ADK and ADI are studying for 2nd-class radiotelegraph licenses at Vocational School with AQ as instructor. CU is installing v.h.f. relay stations for the power co. AMG has been acting as NCS of the P.R. Amateur Emergency Net on 3925 kc. every Wed. at 8 P.M. RD has a 5-kw. emergency power plant. The following meet on the Antilles Weather Net on 7245 kc. at 7 A.M. and 5 P.M.: KP4USA, the NCS, and VP2s AB, DA, DJ, GV, KH, LS, SH, KV4s AA, AY, BA, BZ, KP4s AEB, ALO, FAC, RE, WT, W4EXO/KP4, VP4KW and VP4MM. The Puerto Rico Emergency Net frequency is 7245 kc. to 6 P.M., 3925 kc. after 6 P.M. W4WIV, former NCS of the Kentucky Phone Net, operators at KP4USA 50/60 hours a week. KP4KD has a new Mosley Tribander beam. ADY is building an 813 transmitter to increase the power from the present four watts. WT again is monitoring 3925 kc. 7 A.M.-10 P.M. daily. K5CEV now lives in Ponce. AJK is on 6 and 2 meters and joined the AREC. AJK uses a five-element beam on 6 meters. CK/CL soon will be on with 458-20A-600L. The PRARC has discontinued its WPR50 certificate award and replaced all above 25 with stickers. Traffic: KP4WT 99, DJ 2.

CANAL ZONE—SCM, P. A. White, KZ5WA—Correction to Station Activities in Oct. *QST:* It was WU who moved to Long Island in August with his "V" beam antenna and not WZ, who is now setting up a new Eldico S.S.B. kw. right here in the town of Diablo. The Crossroads Club gave a farewell party in conjunction with [illegible] employees in the Fire Department for UD, who [illegible]tired as fire chief and will live in New York State. H[illegible]s just finished a new code class on the Atlantic Side of the Isthmus. Your new SCM, Ralph Harvey, RV, will take over next month. The new SEC is RM. New ECs are HO and VR. New hams are MN, RL, BS, CE and LP. New Novices are RN, EWN, FWN and LSN. Traffic: KZ5KA 49, HO 36, VR 28, RM 7, WA 5.

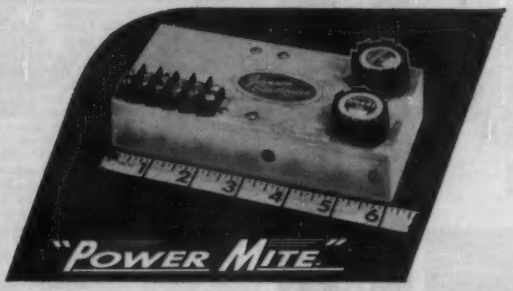
SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB SEC: W6LIP. RMs: W6BHG, K6HLR. PAMs: W6ORS, K6BWD. The following stations earned BPL for the month of September: K6HLR, K6CPT and W6GYH. Congrats, fellows! K6HLR has been appointed manager of RN6 and is looking for liaison stations. A new reporter is WA6BAQ. Glad to have you, Gary! K6OQD put in a lot of time at the L.A. County Fair. K6KYJ, K6OJV, K6TPL, K6COP, K6PLW and W6ORZ are feeling the pinch of schoolwork! W6BHG is taking a well-earned vacation. Have fun, Hank! W6BUK visited some of the MTN gang while on vacation. K6OZJ is getting lined up on RTTY. W6CIS has the CCDN meeting Wed. and Fri. for training and QSO sessions in addition to the regular Mon. night meetings. K6EA still is traveling around as relief "Sparks" for Mateon Lines! W6ORZ is organizing a club at St. Anthony's High School in Long Beach. K6GLS is putting up a trap doublet and getting a new RME operating desk! All you fellows interested in 220 Mc. are asked to contact K6GKX for membership in the Inter County Net, which meets Mon., Wed. and Fri. at 2000 PST on 221.5 Mc. K6SLM spent his vacation in Wyoming. W6MGB has a new four-element wide-spaded beam on 6 meters. Support your section nets—phone, the SoCal 6 Net at 1930 PST on 50.15 Mc.; c.w., the Southern California Net at 1930 PST on 3600 kc. Traffic: (Sept.) K6HLR 1108, K6CPT 640, W6GYH 634, K6OZJ 241, K6PQM 179, W6HJY 121, W6BHG 41, K6COP 32, K6OQD 30, K6TPL 30, WA6BAQ 27, W6USY 18, W6CIS 13, K6EA 12, K6PLW 10, K6GGS 8, W6CMN 7, W6ORZ 7, K6IYJ 5, W6SRE 5, W6BUK 3. (Aug.) K6MCA 1811, K6GGS 8.

ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: YWF. PAM CSN: FMZ. The Annual Hamfest held at Ft. Hauchuca over the Labor Day week end was enjoyed by all. There were lots of fine prizes and plenty of good food. NTK wanted to be thrown in the creek but the best he could do was get all wet in the rain. FMZ is now PAM for the Copper State Net. This net meets at 1930 MST on 3895 kc. For traffic and up-to-minute news around the State check in on this frequency. Everybody is welcome. IBK and K7DHL now take traffic from the 12th Regional Net for Arizona. GFQ is the new EC for the Tucson Area. UVR has been having trouble in his mobile with a gassy 4-10.0. He has a new McElroy tape keyer unit. The Arizona Amateur Club held its September Picnic on the patio at TPG's QTH. It was followed by a 75-meter transmitter hunt won by UXZ, who also won the hunt at Ft. Hauchuca. The AARC now meets in the new United Fund Bldg. at 16th and Osborn Rd. in Phoenix. Traffic: K7BWN 127, W7SUI 67.

(Continued on page 178)

65 WATT TRANSISTOR POWER PACK FOR *MOBILE UNITS*



THE MINIATURIZED TRANSISTOR *POWER SUPPLY*

MODEL PS-6-12

SIZE:	6" h x 3" w x 1" h
WEIGHT:	1 lb. 2 oz.
INPUT VOLTAGES:	6-7 v and 12-14 v
INPUT CURRENTS:	12 amps or 6 amps
AT NO LOAD:	1.5 amps or 0.8 amps
OUTPUT VOLTAGES:	200 and 400 v
OUTPUT CURRENT:	40 ma at 200 v; 135 ma at 400 v
TOTAL OUTPUT RATING:	65 w nominal
TEMPERATURE RISE:	20° C above Ambient 30° C
EFFICIENCY:	Full Load—85%

UNITIZED FOR 6 AND 12 V OPERATION

This special designed POWER SUPPLY used with Transmitters rated to 65W. continuous duty, or 75W. intermittent duty; will also supply a receiver with 200 V. @ 40 MA, continuous duty. Highly recommended for use in all MOBILE TRANSMITTER-RECEIVERS, e.g. automobiles, boats, trucks, motorcycles, aircraft, where power source is 6 or 12 V. Paralleling doubles ratings. ——— **$49.50**

MODEL PSK-6-12 KIT FORM

Identical to Model PS-6-12, except in Kit Form. Complete schematic and detailed assembly instructions included. Pre-tested quality assured components included, no other parts to be purchased. Simple to assemble in Heavy Aluminum Case . . . you save cost of labor. ——— **$39.50**

MODEL PST-6-12; POWER TRANSFORMER

INPUT VOLTAGES:	6-7 v or 12-14 v
OUTPUT VOLTAGES:	200 v and 400 v
CONSTANT LOAD:	up to 65 W.
DUTY CYCLE:	25% to 85 watts

Toroid supplied with 6" leads, Teflon wrapped, epoxy resin coated, proven for salt water use. Unit designed for your own particular power supply. ——— **$14.00**

NOTE: ALL ITEMS EIA GUARANTEED.

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Enclosed please find CHECK_____ MONEY ORDER_____
TOTAL AMOUNT_____for the following
( ) MODEL PS-6-12 at $_____ each_____
( ) MODEL PSK-6-12 at $_____ each_____
( ) MODEL PST-6-12 at $_____ each_____
SHIP TO: _____
ADDRESS: _____
CITY: _____ STATE:_____

HEART OF THE MISSILE COUNTRY

SAN DIEGO—SCM, Don Stansifer, W6LRU—W6GBG is back in San Diego after a tour of duty in Turkey. K6ITH is now active from KG4AO. W6GUP has moved to Blythe from Brawley. K6GJM received his General Class license and was promptly elected president of the Ryan Club. The Ryan Club is conducting code practice two nights a week on 40 meters. K6RZC is chief operator at W6YDK and the station continues to handle traffic. K6ZRC, in Fullerton, is now an OO. W6ELQ is back on the air handling traffic on PAN, CCDN and TCC. KN6TUP, in Pine Valley, has now worked 24 states. W6RCD has worked 97 countries on sideband since March, to bring his phone total to 162 worked. W6BLZ finally got long overdue cards and has applied for his DXCC certificate. W6NXP becomes the 11th member of the San Diego DX Club to get his WAZ. K6BHM was home on leave and attended the convention. Worked KL7MF recently and Hal asked his many San Diego friends to watch for him on 14 and 21 Mc., c.w. and phone. He is ex-W6MI/SIG. He became a grandfather this summer. The October meeting of the San Diego DX Club was held at the home of W6LRU. K6HQJ is now EC for 10 meters, replacing W6WYA who resigned recently. K6TXR is net control, and the net is called at 7 P.M. Tue. on 29.5 Mc. K6JPI, K6BPI, K6HQJ, W6KBT, W6EOT and W6PKZ participated in three different disaster alerts during September, aiding in two fires and one missing person hunt. Traffic: W6YDK 543, W6EOT 276, W6ELQ 92, W6SK 73, K6EQL 12, W6ISQ 3.

SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—The Santa Barbara Radio Club had Woody Smith, from Gonset Company, give a talk on the Gonset GSB-100. The GSB-100 has some s.s.b. circuits worth looking into. W6BE recently received his Advance Class ticket. K6KPU sold his Viking mobile transmitter and got the Gonset Twins for his new mobile. It sure looks classy. K6DXW worked XE1NL, Mexico City, from his mobile rig running only one watt. K6CRJ is back on 10-meter phone with a Viking Adventurer and screen modulator. K6HAV has his Apache transmitter finished now and has been heard on 40 meters. Two new 2-meter stations in the Oxnard Area are W7UVH/6 and K6CNP. Traffic: K6BVA 16, W6FYW 5, W6YCF 3.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX. PAMs: BOO and IWQ. RM: ACK. One thing I like better than to receive an invitation to a hamfest is to be able to attend. The San Angelo Club held its second with approximately 200 in attendance. I was impressed with K5CNB, EC for the County, and the civil defense group. Doc tells me there is an average of 16 stations checking in on the weekly drill-nights. W5NFO went to Tahoka to assist in organising the Caprock ARC. IEB was elected pres.; K5LIB, vice-pres. There are ten charter members and a code and theory class already has been started. EPO has returned to Ft. Worth after a two-year stay in Japan. VEZ has completed his station set-up with a new 75A-4. ILF/5 is now active in Levelland. HZF is building a sideband rig. After reading the reports from the OOs I think more time should be spent reading the *Handbook* and FCC regulations than operating. There is a reason but *no* excuse for harmonics, key clicks and off-frequency operation. Many operators show their appreciation for notices by replying, others seem to ignore them. Better heed the warnings or the FCC will get you. Ft. Worth has an FB 6-meter net going with more than 50 checking in each week. BOO reports 30 sessions for NTO Net for September with 917 checking in and handling 272 messages. Ham Day at the Dallas Fair was a big success with more than 800 present. ETA, our Director, gave a fine talk on "What the ARRL means to You." Traffic: W5SMK 243, BTH 140, BOO 92, K5PXV 55, JSN 44, JBQ 23, DNQ 17, JZK 15.

OKLAHOMA—SCM, Richard L. Hawkins, W5FEC—SEC: K5KFS. RM: JXM. PAMs: DRZ and MFX. Congratulations to BNU, K5BPV and VVQ on meeting the requirements for issuance of Sooner Traffic Net certificates. K5SJX and K5OVF dropped the "N" from their calls. NS took the fatal step by adding the s.s.b. kit to his Apache. MRK received an IGY pin for his "Moonwatch" work. MMD added a kw. final to his rig. Preacher DRZ has the Sooner-Nooner Net going full blast on 7 Mc. He reports 20 sessions, 444 check-ins and 146 messages handled. K5CAY handled over fifty messages from Okinawa to the States. Congrats to K5JCB on his top score for Oklahoma in the CD Contest. Your SCM attended the ham day at the Texas Fair. K5EGS/6 is being worked by the Lawton hams on 29 Mc. K5KTW is being transferred to Tulsa. Remember, all hams are invited to check into the Oklahoma phone and c.w. nets whether or not you are ARRL members. Oklahoma's Ham of the

(Continued on page 174)

FOR THAT PERFECT CHRISTMAS GIFT... CHECK WITH ARROW'S HAM DEPT.!

Globe Sidebander DSB-100

Bandswitching 10-80M; 100W P.E.P. DSB input, suppressed carrier; 40W AM phone; 50W CW.
Amateur Net (Kit) **$119.95**
Amateur Net (Wired & tested)... **$139.95**

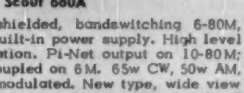
VOX Model 10. For voice operated control, with extra contacts for auxiliary circuits. Plug in socket at rear of DSB Xmtr. Adaptable for other Xmtrs.
Kit – **$19.95** Wired & tested – **$24.95**
QT-10. Access. for VOX. Wired. **$9.95**

Globe Scout 680A

TVI shielded, bandswitching 6-80M, with built-in power supply. High level modulation. Pi-Net output on 10-80M; link-coupled on 6M. 65w CW, 50w AM, plate modulated. New type, wide view shielded meter. Kit completed with all parts, tubes, pre-punched chassis and detailed instructions.
Amateur Net (Kit) **$99.95**
Amateur Net (Wired & tested)... **$119.95**

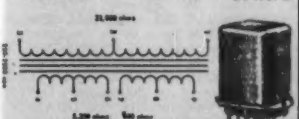
Globe Code Oscillator Kit

Transistor and printed circuit assembly, Code Practice Oscillator, Screw terminal input for key; standard phone tip output jack. Kit complete with batteries.
Amateur Net **$4.95**



Hy-Gain Rotobrake

Complete rotating assembly including rotator, brake and wall-map indicator. Built to rotate and hold like the "iron fist" without damage to beam.
Amateur Net **$149.95**



Versatile Miniature Transformer

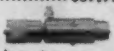
Same as used in W2EWL SSB Rig – March '56 QST. 3 sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22,000 ohms. (By using the centertaps the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. Brand new. Fully shielded.
Amateur Net, each **$1.39**
3 for **$3.49** 10 for **$10.75**

Hallicrafters Model S-38E

Broadcast band 540-1650 kc. 3 shortwave bands 1650 kc to 32 mc. Communications type controls for accurate tuning. Separate bandspread tuning control. Headphone tip jacks on rear. Built-in PM speaker. Oscillator for reception of code signals. Four tubes plus rectifier. 105-125 volts, 50-60 cycles AC-DC.
Amateur Net **$54.95**

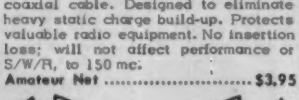
National NC-60 Special

First all-new, low-priced, shortwave receiver in over 10 years. Continuous coverage of AM Broadcast, Amateur & World-wide shortwave bands with full electrical bandspreads on all frequencies, 540kc-31mc in 4 bands. 15 lbs.
Amateur Net **$59.95**



Cush Craft Blitz Bug Coax Cable Lightning Arrester

All new lightning arrester for standard coaxial cable. Designed to eliminate heavy static charge build-up. Protects valuable radio equipment. No insertion loss; will not affect performance or S/W/R, to 150 mc.
Amateur Net **$3.95**



"Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 QST. Complete with B&W 3013 Miniductor. Only 8 ft. long for 10 meters.
Amateur Net **$7.85**

Transcon Twin Noise Squelch

Can be installed in any car radio rapidly, Tubes: 6AK5 & 12AX7. DC power input: 150V. DC to 225V. DC. Filament: 6 or 12V. Noise Level Attenuator: 52. Size: 2¼" x 2½" x 4".
Amateur Net **$12.95**

Field Strength Meter. For both mobile or fixed station use **$11.95**

Dampp-Chaser

Reduces frequency drift. Protects your TX, RX, electronic equipment against moisture damage. The safe, efficient Thermo-Electric Dehumidifier chases moisture before it strikes. Never needs attention—refills, baking out or emptying. Complete with clips and instructions. Order longest size that will fit inside chassis. 24" attached cord solders to power SW terminals. Original equipment in Hallicrafters SX-101.
Model 1E 12½" long, 8W. 117V. **$4.95**
Model 3E 18½" long, 12W. 117V. **$4.95**

Sub-Miniature 0-200 Microampere Meter

A high quality instrument made to rigid U.S. Govt. Specs. by International Inst. Co. (Model 100). Only 1" in diameter. Ideal for limited space applications & transistorized circuits. A natural for the transistorized grid dip oscillator as described in June '58 QST.
Amateur Net $3.95 ea. **2 for $7.50**

2" round 0-500 microamperes. Bakelite case. Made by G.E. and Dejur.
Amateur Net $2.95 ea. **2 for $5.50**

Weston 2" 0-4 amp RF meter Model 507. A giveaway at **$2.95 ea.** **2 for $5.50**

Weston 1½" sq. (ruggedized) 0-100 μa. **$4.50 ea.** **2 for $8.75**

866 filament transformer 110V. primary 2.5V. 10 amp. 10KV. insulation shielded, compact. Shpg. wt. 7 lbs. **$2.95**

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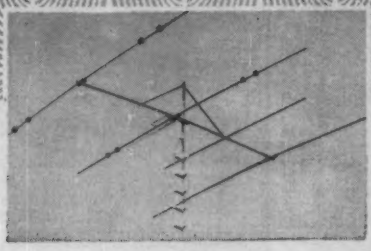
DX Champion of the World
the Hy-gain
FULL SIZED trap tribanders



Insu-Traps
These streamline Hy-gain traps are small (3" diameter) and light weight. Capacitor dielectric and coil form molded high impact styron. Each designed to take 1 KW AM, 2000 watts P.E.P. Individually factory resonated for maximum frequency accuracy. Completely weather sealed, weather proof and airtight (do not breathe) for years of stable operation. Carbon activated polyethylene covers. Guaranteed for the life of the beam. Hi-Q coils well-removed from any metal mean highest efficiency of isolation action.

Smallest Total Wind Loading Area Possible in a Full Size Tribander

Triaxial Gamma Match
Triaxial Gamma Match system with coaxially formed reactance cancelling capacitor built-in, makes possible for first time perfect 1:1 SWR on a 3-band antenna. Factory pre-calibrated yet adjustable to compensate for site variations. Exceptional bandwith maintains low SWR over entire band. Permits tuning array for maximum gain with no compromise to facilitate matching.

Two-Element, Full Size Trap Tribander
Top full-size performance in limited space with one transmission line on 10, 15 and 20M. Boom length 8'. Longest element 32'.
3 db gain 18 db F/B Ratio
69.50

Three-Element, Full Size Trap Tribander
There are more 3-Element Trap Tribanders in use than all other 3-Band Beams combined. Boom length 18'. Longest element 32'.
3 db gain 25 db F/B Ratio
99.75

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FAST SHIPMENT TO ALL PACIFIC POINTS

Month: GOL for his many years of faithful participation and help in the traffic nets. Traffic: W5DRZ 223, K5CAY 180, W5ERI 145, K5DUJ 141, W5PNG 69, CCK 63, JXM 54, FEC 40, K5INC 30, W5KY 30, K5LGV 30, CBA 25, W5MFX 25, GOL 17, VLW 13, K5MBK 12, W5FKL 6, SWJ 5, EHC 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF. PAM: K5ZIN. RM: K5BSZ. MVL vacationed in New Mexico and attended the annual Carlbad Picnic. He has up a Gonset thirteen-element, 2-meter antenna and keeps regular skeds with Alamogordo. LWP has a new shack with rigs for 160 through 2 meters. ES has a new Triband beam. MVL, the OBS at El Paso, sends bulletins at 0900 and 1900 MST on 3820 kc. and at 1915 MST on 144.018 kc. Listen for him at these times. KN5QFL worked portable from the Big Bend National Park with some Explorer Scouts. He handled traffic back to the parents in San Antonio, where KN5QJR was his contact. Congratulations to K5INT, new EC at Yoakum, for signing 7 members in 7 days there. He also has an agreement with the city and county governments for tie-ins with all their agencies. UXO is the new OBS at Village Mills. K5RYS is OPS at El Paso. New officers of the Galveston County Amateur Radio Club are DMM, pres.; K5OHA, vice-pres.; K5OHB, treas.; DJG, secy. K5OQN is the first station to get four 6-meter Century Club certificates. I believe this is a first for the nation, and all with only 6 watts. K5QLN has been mobiling up in Yankee-Land. TKP has been working 6 meters with a 16-milliwatt transistor rig. He has had several contacts with K5OQN over a four-mile path. Glad to hear FCX back on the air. The members of the Corpus Christi Amateur Radio Club would like to express their appreciation to all the stations, too numerous to mention, who were standing by during the Hurricane Ella Alert. There is a new net in Houston on 50.4 Mc. each Sun. at 0900. K5OQN is net control and only AREC members will be answered. This is supervised by AIR the EC at Houston. K5MMV, Satsuma Valley ARC secy., says the club joined Hardin County folks in celebrating their 100th anniversary. Besides this call CQA/5 and K5HGZ/5 were in operation and K5LPE's circulars gave some 800 persons full data on Amateur Radio. Traffic: W5EGD 192, K5OEA 97, KN5QFL 96, QJR 96, K5MZS 65, W5HKE 64, BVP 51, URW 37, FCX 27.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCM: Aaron Solomon, 1OC. SEC: AEB. Visits to two very active clubs, the SONRA (Society of Newfoundland Radio Operators), St. John's, Newfoundland, and SARC (Sydney Amateur Radio Club), Sydney, N. S., were made by your SCM early in October. Sincere thanks to the executives and members of these clubs for their kind welcome. VO News: The SONRA group has obtained a new club house and is running classes in code and theory for prospective amateurs. On-the-air meetings of the club are held the 3rd Sun. of every month on 7210 kc. at 10:10 A.M. NST. New appointments include VO1CZ, who has accepted an Official Observer post. Don't forget the WAVO Award, now available. Details in Sept. 1958 *QST*. Copies of the rules are available from P.O. Box 2125, St. John's, Newfoundland. In v.h.f. news, W1ZVH has a Gonset Communicator for 2 meters while VO1AO and W2ZRX now operate on 6 meters. Maritime amateurs were saddened by the passing of AO and RW. The Sydney Amateurs are progressing rapidly with their new club house. Piracy of amateur calls has shown a marked increase in recent weeks. Please be on the lookout for offenders and report any incident to this office. Traffic: VE1ADH 30, AEB 11, DB 9, OM 4.

ONTARIO—SCM, Richard W. Roberts, VE3NG—AQE was in to see AVS. RH and PD, along with 2PW, visited EII. W8OTK and W8WE were in to chat with AJR. 3DMX and 3FW also were expected. BUR is busy working 15-meter DX. BZB, mgr. of the OSN/PQN, reports that the net has a new name, the OQN. The Quinte group had an FB turnout in September. DPO is doing an FB job of editing and printing the GBARC club bulletin. The Ottawa ARC officers are W9SDP/VE3, pres.; CMW, vice-pres.; EBG, secy.; CDS, treas. The St. Clair Valley Club reports that member W8DPU worked Kurt Carlsen, W2ZXM/MM, on the new *Flying Enterprise II* in the Arabian Sea. The Scarboro ARC has elected the following officers: EBN, pres.; ASE, vice-pres.; EMX, secy.; Sid Prior, treas. DFA and DFC have a new beam. CNA is on 40-meter c.w. The Ottawa Valley Mobile Club is now affiliated with the ARRL. Welcome, gentlemen. If I can help, drop me a line. The Soo boys report they had an FB meeting with the SEC (KM). DYR has a quad. EOV and EOW have new WAS certificates. How about some appointment certificates, lads? Write to your SCM for information. Any appointees who have forgotten to send in certificates for endorsement should do so as soon as possible. The Toronto gang

(Continued on page 176)

SESCO'S Gigantic Year End Sale

SPECIAL FACTORY PURCHASE OF BRAND NEW MORADCO EQUIPMENT

SAVE $105.00 over nationally advertised prices on Moradco MB-565 Transmitter and MB-6 Receiver Combination!

MORADCO MB-565 TRANSMITTER

Features turret-type, hooded, illuminated dial. Covers 80-40-20-15 and 10 meters, VFO or crystal controlled. 60 watts input. PI network final operates into 50 to 75 ohm antenna or antenna tuner. Size: 4⅛"x11⅞"x7¼". Ship. wt. 14 lbs.

SAVE $50.00 Sale Price $199.50

MORADCO MB-6 RECEIVER

Matches MB-565 Transmitter. 13 tubes – 20-tube performance. 100 kc calibrator, "S" meter that converts to an F. S. meter for transmitter tune-up. 1 microvolt sensitivity. Noise limiter and very sensitive noise-balanced squelch. Size: 4⅛"x11⅞"x7¼". Ship. wt. 12 lbs.

SAVE $55.00 Sale Price $184.50

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EASIEST TERMS

10% down on approved credit; up to 24 months on the balance. No carrying charge if paid in full within 90 days.

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CM3 CONELRAD MONITOR AND BROADCAST RECEIVER
Sale Price $29.95

90-DAY RMA WARRANTY • *All Prices F.O.B. Salem, Oregon*

FAST DELIVERY SERVICE—Your inquiries and orders handled same day received.

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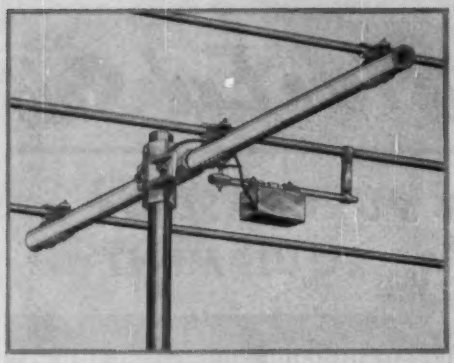
QUAN.	ITEM	MODEL NO.	PRICE

Ship by ☐ Parcel Post (including postage with order).
Ship by ☐ Railway Express (will be shipped Express Collect).
☐ Check ☐ Money Order enclosed for sum of $_____
☐ Send catalog and Easy Payment forms to fill out.



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Because our Plytubular Construction, a process of fabricating multi-ply aluminum booms and elements, permits smaller diameters for less ice loading, wind loading, vibration and torque. No struts or braces.

Better Match

Because our Tuneable RG and Coax-O-matic RGX gamma systems are constant, rain or shine. No coils, traps or baluns.

Better Price

Because we design for many years of service and guarantee against defective parts for a period of five years. The cost per year of a Tennalab Plytubular Beam is lower than any other, regardless of price.

Catalog No.	Bands	Elements	Amateur Net
9L-10152ORG	10-15-20	3-3-3	$217.50
6L-1015RG	10-15	3-3	105.00
6L-1020RG	10-20	3-3	157.50
6L-1520RG	15-20	3-3	165.00
13L-26RGX	2-6	8-5	65.00
2L-20RG	20	2	67.50
3L-20RG	20	3	107.50
5L-20RG	20	5	225.00
3L-15RG	15	3	65.00
5L-15RG	15	5	157.50
3L-10RG	10	3	55.00
5L-10RG	10	5	107.50
3L-6RG	6	3	37.50
5L-6RG	6	5	65.00
5L-6RGX	6	5	55.00
5L-2RGX	2	5	10.75
15L-2RGX	2	15	75.00
CR-2RGX	2	**	42.50

** Corner Reflector

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TENNALAB

QUINCY, ILLINOIS

was disappointed when the National Air Show was all but cancelled. Under DSM they were to assist in the control (communications) of the Governor General's Cup Race. Bad weather prevailed. AJA was a visitor to Kapuskasing. ELC is back in Toronto. ARF and DVM are back in Bowmanville for the winter. DUU has recovered from his hand injury. RH and TX are the new PAMs. Traffic: VE3BUR 77, NG 75, AUU 70, NO 67, DPO 65, EII 65, BZB 55, EBB 49, DTB 44, DEX 33, CHF 31, EIK 30, DUU 25, KM 24, AJR 23, AML 22, BH 20, BOY 20, ELC 16, DOC 11, CE 10, ELU 9, DSM 7.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—OQN, the c.w. net, meets daily on 3535 kc. at 1900; the Quebec Fone Net daily on 3780 kc. at 1845. The MARC sponsored a successful "Rally." An outstanding attraction proved to be a hidden transmitter hunt. A young chap, Eric Lloyd, posed as a beautiful girl and carried a transmitter hidden in a handbag with a mike (a la Dick Tracy) strapped to his arm. He was accompanied by another smart lady who took care of the power supply. These two "ladies" really had the searchers buffaloed. This clever trickery received prominent space (plus pictures) in the local press. VE3UY won the 80-meter hunt while ASW copped the first part. MW did a good job as chairman, assisted by TA, HI, AZT and MB. DU was M.C. and W1BUD, from Headquarters, was guest speaker. VV deserves great praise for amassing such fine prizes. As usual Jean (Mrs. BB) worked hard. The rally was well attended by out-of-towners. General News: ACD received phone endorsement. AWK now is ready to apply for WAC. ARH works 144 Mc. VE8AT attended the rally and passed on interesting information re VE8-Land. K2QJL visited ATL. 7QR, while on a 'round-the-world trip, visited XX. AKY now is GZ. IK was VE3AAS. WT, from Joliette, is on 20 meters. AWV is striking DX gold with a quad on 10, 15 and 20 meters. The St. Maurice Valley Club holds regular monthly meetings and is setting a good example by planning now for 1959 Field Day. Ham TV in the Montreal Area is supported by AZT, AKT, JF, AFM and LS. Traffic: VE2DR 133, EC 28.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—SEC: KX. Thanks to EV for his Northern news. ADM is boning up on TV so they can modulate a milk bottle in Dawson Creek to keep the people happy when they get snowbound in the winter. XY has a new house and has chopped holes, etc., for antennas through the new woodwork but eventually he will be back on. AN also is house-building. AKS and EV still are active on some bands. MG is back in Alberta. AD is the new net manager of the BCEN on 3650 kc. Mon. through Fri. at 2000. The gang on 3650 kc. will gladly welcome anyone who wishes to handle traffic. AAF reports that XD and AER are doing a good job on the V8WC paper, *Zero Beat*. I'm sorry to say I have never seen a copy. The gang in Nanimo still turns out a paper with the best veiled invectives that I have read in a long time. Keep it up, fellows, and hope you send the paper where it will do the most good. TF and AD, along with other faithfuls, have the BCEN going strong, with VE5s and 6s now checking in. New ORSs are AD, AAF, AEC and AOI. There are others who could hold appointments if they were ARRL members. NJ, in Victoria, still is battling QRN. A large chain or a .22 might help, Frank. Hope you all have a Merry Christmas and a Happy New Year. Traffic: VE7TF 93, AAF 15, FS 14, AD 10, AC 4, AEC 4.

MANITOBA—SCM, James A. Elliott, VE4IE—Highlights of the month were a hidden transmitter hunt, a scavenger hunt and a weiner roast sponsored by the ARLM. Attendance was high and the gang had a fine time. A Smorgasboard is planned for November, which will be the windup for the year. A successful civil defense exercise was held Sept. 19 in which many of the local mobiles participated. Congratulations to TA on winning the No. 1 Worked All Winnipeg certificate. RC made a historic move! George put wheels under his shack and moved, equipment and all, down the main drag of Winnipeg and out to his new QTH at Birds Hill. The ham radio course at Tech. Voc. High is under way with 20 members enrolled. JW has been very busy selling tickets, handling traffic for the north and with Beausejour Radio Club activities. Keep up the good work, Bill. With the cold weather setting in considerable activity is expected from now on, so let's hear from you. Traffic: VE4JY 27, KN 23, GE 8, QD 8, RR 6, PA 5, AN 4, XP 4, MM 3, HH 2, EN 1, KK 1, NW 1.

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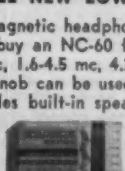

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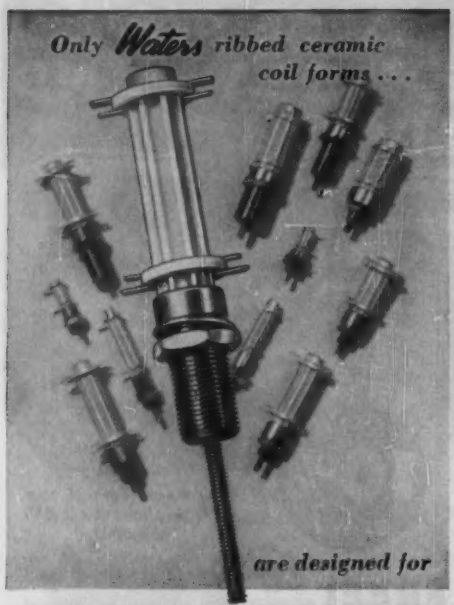

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"SimpleX Super" Receiver

(*Continued from page 14*)

forth with the b.f.o. turned off; you should find a spot where the noise rushes up quickly and then drops off. This is the crystal frequency, and L_3 and L_4 should be peaked again on this frequency if you were a little off the first time.

An antenna connected to the receiver should now permit the reception of signals. With C_1 nearly unmeshed, you will be in the region of the 7-Mc. band, and with C_1 almost completely meshed, you will be near 3.5 Mc. Do your tuning with the compression trimmer in the oscillator circuit, until you find a known frequency (it can be your own transmitter). Let's say your transmitter has a crystal at 3725 kc. Set C_2 at half capacitance and tune with C_6 until you hear your transmitter. You shouldn't need any antenna on the receiver for this test. Once you have the setting for the trimmer, put the antenna on the receiver and look around for other known signals. (CHU, the Canadian standard-frequency station at 7335 kc., is a good marker.) With luck you should just be able to cover the 80-meter band; if you can get one end but not the other, a minor readjustment of the trimmer is indicated.

Once you have acquainted yourself with the 80- and 40-meter bands, and appreciate that you have to peak up the input circuit (C_1) fairly often as you tune across the bands, you are ready to trim up the crystal filter. Run the volume fairly high, so that you can hear noise from the properly-peaked input circuit, and turn C_3 until the noise takes on a higher-pitched characteristic. (The b.f.o. stage is originally set up with C_3 at midcapacitance and L_5 adjusted for lowest-pitched noise.) Now tune in a code signal with C_2 and swing back and forth through it. "One side" of the signal should be louder than the other. Tune to the weak side with a beat note of around 800 cycles and then adjust C_4 for minimum signal. After a few attempts, juggling C_3, C_4, L_3 and L_4, you should get a condition where the single-signal c.w. effect is quite apparent.

All that remains is to install the dial scale and calibrate it. A 100-kc. oscillator is ideal for this job; lacking one or the ability to borrow one, you will have to rely on other signals. If your crystal filter is 1700 kc. exactly, the 80- and 40-meter calibrations will coincide as they do on the receiver shown in the photographs; if not, the calibration marks will be offset on the two bands.

If you find that you can't get WWV at 5 Mc. with the 150-$\mu\mu$f. capacitor switched in, it is no cause for alarm. Simply substitute a 130-$\mu\mu$f. mica in parallel with a 30-$\mu\mu$f. compression trimmer, and adjust the trimmer so that WWV falls on scale.

Performance

As you acquaint yourself with the operation of the receiver, you will notice that tuning C_1 will have a slight effect on the tuning of the signal.

(*Continued on page 180*)

HOT FOR 6 AND 2!

GLOBE HI-BANDER

55 Watts AM phone, 60 Watts CW input on both 6 and 2 meters

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73, Bil Harrison, W2AVA and all the Harrison Hams

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In other words, tuning C_1 "pulls" the oscillator slightly. To remedy this would have made the receiver more complicated, and the simple solution is merely to first peak C_1 on noise and then tune with C_2.

You will find this to be a practical receiver in every way for the c.w. (or s.s.b.) operator. The tuning rate is always the same on 80 or 40, or 15 with a converter and 21-Mc. s.s.b. signals tune as easily as those on 3.9 Mc. The warm-up drift is negligible, and the oscillator is surprisingly insensitive to voltage changes. Whether or not the oscillator is insensitive to shock and vibration will depend upon the care with which the components are anchored to their respective tie points.

(Yes, Virginia, there is a Santa Claus. But there is no known way to add an S meter, a.v.c., noise limiter or Q multiplier to the SimpleX Super without additional tubes or semiconductors.)

Wide-Band Dummy Loads

(*Continued from page 23*)

Appendix

The possibility of wide-band compensation of slightly inductive resistors with shunting capacitors is shown in the following way:

1) Assume a resistance R_s in series with an inductive reactance X_s.

2) The parallel equivalent of X_s is

$$X_p = \frac{R_s^2 + X_s^2}{X_s}$$

3) If X_s is much less than R_s,

$$X_p = \text{approximately } \frac{R_s^2}{X_s} = \frac{R_s^2}{2\pi f L_s}$$

4) Where an inductance is paralleled with a capacitance, neither appears to be in the circuit when the capacitive reactance is equal to the inductive reactance. Thus the condition for cancellation of the inductive effect occurs when the parallel inductive reactance X_p equals some parallel capacitive reactance $X_c = \frac{1}{2\pi f C}$, which is another way of saying

$$\frac{R_s^2}{2\pi f L_s} = \frac{1}{2\pi f C}$$

or

$$\frac{R_s^2}{L_s} = \frac{1}{C}$$

5) This last expression has no frequency term in it, showing that a small inductive reactance can be nearly eliminated at all frequencies by a single fixed capacitor.

Technical Correspondence

(*Continued from page 44*)

band components produced by the telemetry frequencies. As these frequencies are rather closely spaced to the carrier frequency and each other, the result is the generation of at least two complete sets of spurious frequencies plus the original beat frequency, all of which are continuously changing from doppler shift and/or receiver instability.

If, in addition to this, harmonic distortion is present within the receiver or tape recorder, then to add to the existing woes a second-order collection of intermodulation products appears in the output. The result is similar to the "search for a needle in the haystack" with the needle being periodically moved.

Having rather thoroughly covered the dark side of the

(*Continued on page 182*)

Meet the Miniature Mini-Tribanders

THE hy-gain, SMALL SIZE, 3-BAND BEAM (10, 15 & 20), WITH SINGLE FEED LINE FOR MAXIMUM LEGAL POWER!

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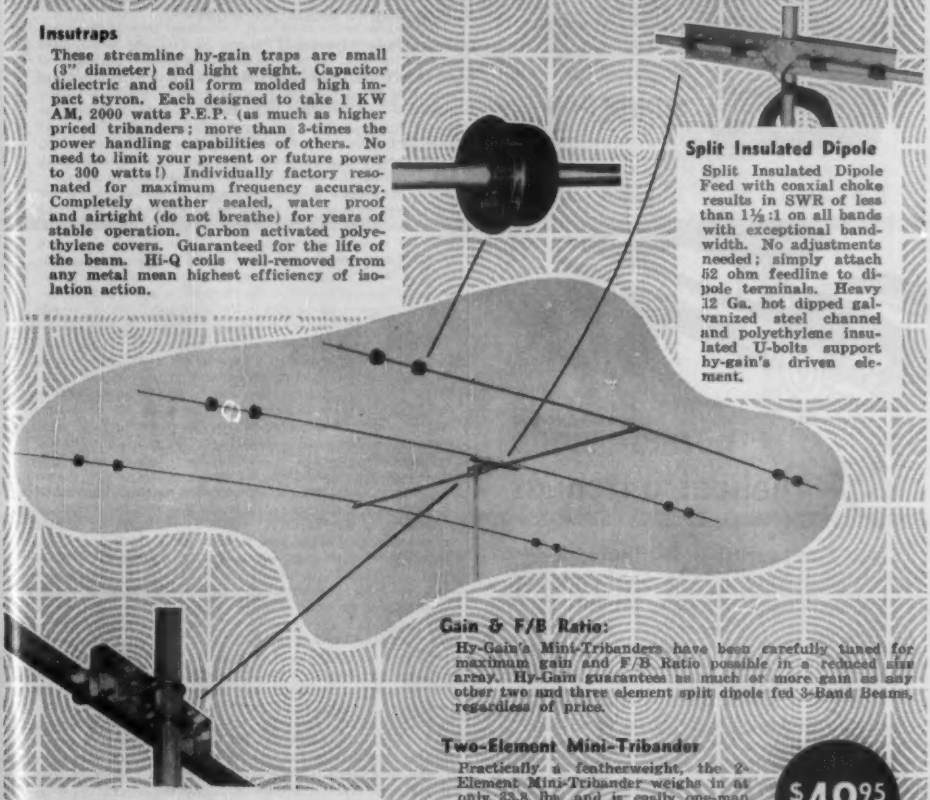
These streamline hy-gain traps are small (3" diameter) and light weight. Capacitor dielectric and coil form molded high impact styron. Each designed to take 1 KW AM, 2000 watts P.E.P. (as much as higher priced tribanders; more than 3-times the power handling capabilities of others. No need to limit your present or future power to 300 watts!) Individually factory resonated for maximum frequency accuracy. Completely weather sealed, water proof and airtight (do not breathe) for years of stable operation. Carbon activated polyethylene covers. Guaranteed for the life of the beam. Hi-Q coils well-removed from any metal mean highest efficiency of isolation action.



Split Insulated Dipole

Split Insulated Dipole Feed with coaxial choke results in SWR of less than 1½:1 on all bands with exceptional bandwidth. No adjustments needed; simply attach 52 ohm feedline to dipole terminals. Heavy 12 Ga. hot dipped galvanized steel channel and polyethylene insulated U-bolts support hy-gain's driven element.

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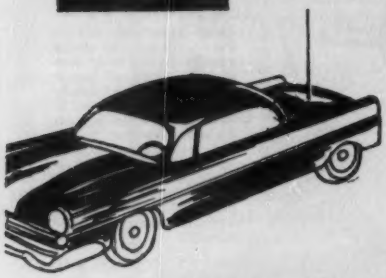

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picture a few positive thoughts on the subject might be appropriate. A few suggestions are given to minimize the difficulties that have arisen from the existing recording procedures.

Receiver tuning procedures may be somewhat different depending upon the type of modulation used in the transmitter. If the transmitter is frequency modulated, the f.m. receiver should be centered on the carrier as in standard tuning procedures, either by using the telemetered signal for tuning or, preferably, a stable reference oscillator whose frequency calibration is known accurately.

In the case of the amplitude modulated transmission, two approaches are possible. First, the receiver may be adjusted so that its band width is sufficient to receive both sets of sidebands with little attenuation. An alternate procedure would be to operate the receiver more or less as a single-sideband system with a band pass adequate to accept the carrier frequency plus one set of sidebands, with due allowance for doppler shift. In either case, crystal filter operation of the receiver is inadvisable unless the filter rejection peak is well outside the carrier or highest sideband frequency.

If at all possible a crystal reference oscillator is advisable for tuning purposes. No adjustments whatsoever should be made to the receiving equipment during a satellite pass, with the possible exception of a quick tuning check during the maximum signal condition if a good reference oscillator is not available. One reason for this is that certain types of data-reading equipment — for instance, a wave analyzer — may be sensitive to changes in the noise spectrum as caused, for example, by receiver tuning.

In many cases telemetry signals which may not be at all audible may be translated quite readily. If the presence of the carrier is indicated by an increase in the receiver noise, valid telemetering information may be present and recording should be started at this time. Assuming the receiving system is properly adjusted to pass the carrier and sideband components, the audible signal-to-noise ratio is determined by these adjustments. However, this is not the signal-to-noise ratio as viewed from the standpoint of an individual telemetry channel, which is much more narrow than that of the receiving system as a whole. As a result, the signal-to-noise ratio of the individual telemetry channel is improved by a factor equal to the total receiver band width divided by the telemetry filter band width. This improvement factor in itself is adequate to make an apparently useless signal easily readable. In addition, it is not difficult to read at least 20 db. below the noise existing within the filter band width by employing a technique no more complex than an oscilloscope whose vertical input is the telemetered signal and whose horizontal input is an external audio oscillator. The technique, of course, is that of frequency measurement of the subcarrier oscillator by zero-beating the reference oscillator. The approach is both simple and reliable and has been used in reading many data tapes. This method may be satisfactorily employed even without the use of band-separation filters for the various telemetry channels.

The final data interpretation from both amateur and professional tape recordings is highly dependent upon an accurate knowledge of the time at which the recordings were made. The signal strength at each receiving station varies greatly between various satellite passes as well as during a single pass. It is necessary, therefore, to analyze the data from several stations which may be receiving the signal approximately at the same time. If the recorded time is not known for each station, the data may be incomplete, confusing, or even worthless. In general, this requirement has been recognized by amateurs who have participated in this program.

Various methods of recording time have been used by amateurs. One amateur handled the problem by switching from telemetered data to WWV for the five-minute voice and code announcements and also for a few seconds' break for each one minute mark. This method, while excellent, generally requires the use of a second receiver. An alternate method that should be quite good would be the accurate setting of a clock or watch to WWV before the satellite pass, and voice recording the time for each minute and five minute period. A third possibility would be the recording of time in code by either an accurate 400-cycle oscillator or the 60-cycle a.c. line. In either case, the start of the minute would be indicated by a five- to ten-second dash following the code announcement. The use of either an accurate 400-cycle or 60-cycle frequency has the additional merit of providing a check on the exact speed of the recording and reproducing

(*Continued on 184*)

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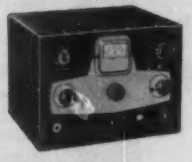

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equipment. A worthwhile modification of the above idea would be to continuously record the selected tone at a low level and amplitude key its level for code recording. If possible, the time error should be held to less than one second.

The above information is not meant to discourage the efforts of those who have undertaken measurements of the satellite transmissions but merely to point out possible improvements which might be made in the receiving and recording of data. This laboratory is well aware of the major contributions which the amateur fraternity has made to science. We have the greatest respect for their efforts and results, and fully expect that their contributions to future technology will be equally great.

The writer wishes to express his appreciation to Messrs. N. W. Mathews of the Naval Research Laboratory and L. N. Cormier of the National Academy of Sciences for their comments and suggestions.

— Frank K. Dearborn, Project Scientist

Technical Topics

(Continued from page 56)

loss. But in order to make computations similar to those above it would be necessary to have tube data covering simultaneous swinging of the control grid and screen at r.f. while using negative bias on the control grid and positive bias on the screen. It is well-nigh impossible to extract the necessary information from currently-published tube characteristics and curves. A meagre amount of operating data has accumulated, all based on amateur experience with particular amplifiers, but practically none of it is quantitative in the sense that it can be used for design purposes. *— C.G.*

Screen Protection

Stephen Goch, K2IVB, has pointed out some disadvantages of the screen protective system shown by W4SUD in his circuit on page 36 of the August issue. As K2IVB states, when the contacts of K_1 break as a result of overload, the winding of the relay will be de-energized and immediately close again, resulting in a "buzzer" action. It is also pointed out that during the time the relay contacts are open, the 1000-$\mu\mu$f. capacitor below the relay and the relay are at full d.c. plate potential above ground and should be insulated for at least this value.

One possible remedy for the "buzzer" action would be the substitution of a double-throw relay with a resistor connected between the back contact and ground. This resistor should have a value such that it would draw sufficient current to keep the screen contacts open. The relay contacts would return to normal position upon removal of plate voltage. *— Ed.*

Strays

K2SRK tells us that K2YEA has a parakeet which learned to whistle the code during the course of some code practice sessions at K2YEA's.

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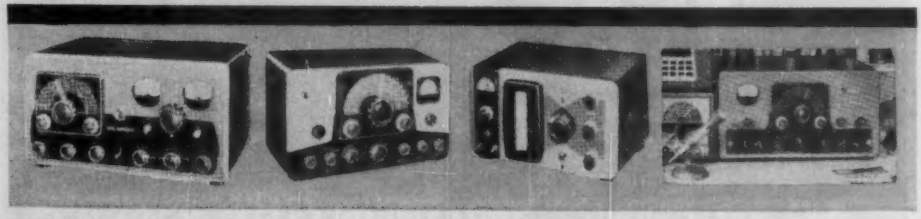

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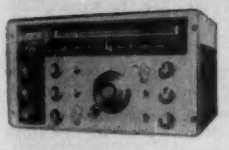

NATIONAL NC-303
Dual conversion on all bands. Crystal controlled 2nd converter oscillator. Slide-rule dial with ten dial scales, 160 to 1¼ meters; easily readable to 2 kc without interpolation up to 21.5 mc. Exclusive converter provision for 6, 2 and 1¼ meters. Separate linear detector for SSB will not block with RF gain full open. Giant "S" meter. Provision for external control of RF gain automatically during transmitting periods. Muting provision for CW break-in operation. Calibration reset adjustable from front panel. Socket for plug-in crystal and WWV calibrator. Accessory socket for powering converters and future accessories. Fifteen tubes including rectifier. **$449.** less accessories.

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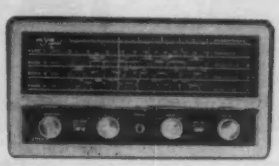
Standard broadcast, CD, WWV, marine, aircraft, amateur and foreign shortwave freavencies clearly marked on giant dial. Operates 115 volt AC or DC. Logging scale and built-in speaker. Exceptional sensitivity, separate tuning coils for each band. Separate general coverage and bandspread tuning capacitors connected in parallel on all bands. Two-gang capacitors tune signal input and HF oscillator. Bandspread knob can be used as vernier on all frequencies. Two-stage amplifier with 50C5 output tube. Front panel phone output jack. **$59.95**



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Recent Equipment

(Continued from page 45)

the form of a color-coded harness. Nevertheless, the remainder of the job will constitute a task approaching 50 hours. This time can be easily doubled if you don't follow the instruction-book suggestion to sort out all of the parts before starting the assembly. There is a multitude of small components and pieces of hardware and, if you don't set up some sort of system for yourself, you'll be spending most of your time hunting for the right combination of screw, lockwasher and nut — there are several sizes of each. (Furnished with the kit is a soft plastic nut starter which is the slickest gadget we've seen for fishing a nut onto a screw in a tight place.) You will find it well-nigh impossible to make many of the connections with the standard 100-watt soldering iron with ¼-inch tip; a miniature iron with a ⅛-inch tip is essential. As usual, most of the small components are clustered around the miniature sockets and it will pay you to make a close examination after each soldering operation to make sure both that the soldered joint is secure and that there are no shorts. Running down a poor connection or a short circuit after the assembly is complete is likely to be an exasperating chore, since many of the terminals will be hardly accessible to test, or even examination. Particular care should be used in mounting the selectivity switch, because there is very little clearance above the many exposed terminals of components already mounted and wired below the switch (as viewed from the bottom). Also, take a close look at the switch-assembly sketch or you may be putting on the last component when you discover (as the writer did) that you have the whole business reversed!

The dial, which the constructor assembles, has a combination of four gears to drive the tuning-capacitor gang. Two of these gears are of nylon to assure smooth operation and long wear. Another is a spring-loaded split gear to minimize backlash. The pointer for the slide-rule dial is string-driven from a large pulley on the tuning-capacitor drive shaft. String drive is also used between a pulley on the band-switch shaft and the dial-scale drum. The calibrated slide-rule dial scale is 10 inches long and has a calibration mark every 5 kc. on all bands. Each band occupies essentially the full length of the scale. (The tuning range for use as i.f. for the 6- and 2-meter converters which Heath plans to produce shortly is 24 to 28 Mc.) It takes 14 turns of the tuning knob to cover each tuning range. Operators who are accustomed to a weighted free-spinning tuning knob will have to get acclimated to the Mohawk; those who have operated Collins receivers will be right at home.

Alignment

The designers have devised a way of making an accurate alignment without the need for instruments. Preset trimmers are furnished to pad temporarily the 14-Mc. range so that 10-Mc.

(Continued on page 188)

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Harvey WELLS DOUBLE CONVERSION R-9 RECEIVER

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Radio Shack's quick cash to the manufacturer brings you the receiver buy of the year! A great value at the $159.95 regular amateur net price — now a bargain you may never again be able to equal! Want to talk trade? Write for a quote on your old rig!

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80 meters	3.5 to 4.0 Mcs.
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INTERMEDIATE FREQUENCY: 1600 and 260 Kc.

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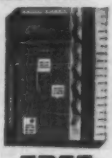

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signals from WWV can be used to set the crystal calibrator accurately to 100 kc. From then on, either the calibrator itself or the b.f.o. (calibrated from the calibrator) is used as a signal generator, with the S meter as an indicator. The front end is prealigned and requires no adjustment.

The instruction book is quite complete and anyone who will follow the step-by-step procedure carefully should have no trouble in ending up with a very satisfactory communications receiver. The chassis, panel, cabinet and other mechanical components are not flimsy. With the two panel brackets in place and the receiver in its heavy perforated cabinet, frequency stability under mechanical stress is good. Effects of temperature and humidity have been minimized by the use of ceramic insulation, including coil forms, throughout the high-frequency circuits, and by the crystal-controlled oscillators in the first converter.

The unit measures 19½ inches wide, 11⅝ inches high and 16 inches deep. It weighs 52 pounds, and draws 75 watts from the line.

— D. M.

Field Day Results

(Continued from page 64)

CLASS E

Grouped in this tabulation are the scores of home stations operated from commercial power sources.

WØUPB [12] 319, W4WKQ 298, K4JLA [16] 286, K2EIU 195, W4KFC 184, W3YWU/3 [2] 178, W9BZW 163, K2LTI 163, W9NH 159, W1AW [12] 150, K6UKX 147, WØIVH 140, K1DRX [2] 129, K8EEG 129, K8DEK 126, K4OCZ [17] 123, W2DRV 121, K6KVC 116, W8DLZ/8 [13] 114, W6IPH 112, K7AIH 111, W4YOX 106, W8WGR 105, K4CAX 102, K9EYL 102, K2MFF 100, K1CBR 99, W3JNP/3 [2] 93, K4KIR 92, K2PGJ 88, K2YMB [2] 83, W3SOH 81, W2SKS/3 [2] 75, K6KYJ 75, W4AWS 72, K6CJQ 72, K9IKV/9 [17] 68, K6ORG [17] 67, K3BKT [2] 66, W4VTO [2] 64, K6VKF 63, W8YCF 59, W2GIX [2] 54, K2RGN 50, K4OKZ 50, K9CBE 50, K4KZP 47, K8EJL 46, K5KLA 45, W8UDB 43, KØIWK 42, W4WSF 41, K4TDX 40, W6DWJ 33, K6APB 31, K2ZUV 30, K6BFZ 30, W2BOT 29, W6AM 29, K8EEB 29, K2VNK 28, W8GWA 27, K3BUX 27, W8GRG 26, W9QGA 26, W4EIE 25, K2VNL 25, K3BZV [2] 24, KØCMX [2] 24, W8IBX 21, W8SEB 20, K4QYW [2] 19, K2RDP 18, K5K8I 18, K6HOV 17, K9AUB 17, W3JWZ 16, W6DFR [2] 16, WØVCH 16, W1AMJ 13, K1EKE 13, K8HEQ 13, W1ADR 12, KN4RNG 12, K4GKT/4 [2] 11, K9GDF 11, K6HYX 10, W2TLJ 9, W3UJP 9, W3UIU 8, K1ATY 7, K6CQF 7, W7BED/5 6, K4CQA/8 6, K8DUG/8 6, W2VCX 5, K2QBV 5, W5KTA 5, K8EXF 5, W1OPB 4, W1ZMB 4, W2KVL 4, WN2RZK 4, W6FFV 3, K9KBW 3, K9KEP 3, K9KSH 3, KN2QBD 3, W7CWN 2, KØBCD 2, KØLLB 2, KN1DKF 2, KN2KUA 2, KN5LLJ 2, W1AD 1, K1BQB 1, K2VQZ 1, K4RIG 1, KØIBM 1, KN7CWO 1, KL7CRE 1.

[1] W9s DSP GDW, oprs. [2] 2 oprs. [3] W8s HXB IAU, oprs. [4] W2EZJ, opr. [5] W6HBF, 2nd opr. [6] KNØMFV, 2nd opr. [7] 4 oprs. [8] W9ASG, 2nd opr. [9] 9 oprs. [10] W2SSC, 2nd opr. [11] K2LQU, 2nd opr. [12] 3 oprs. [13] 6 rigs, 25 oprs. [14] 3 rigs, 12 oprs. [15] 5 rigs, 23 oprs. [16] 2 rigs, 9 oprs. [17] 2 rigs, 2 oprs.

Hints and Kinks

(Continued from page 71)

The neon indicator is then capacity-coupled to the tank coil by soldering a piece of insulated wire to the base of the bulb and bending it so that it is near to, but not touching, the coil. The amount of coupling may be changed by varying the distance between the wire and the coil until the desired brilliance is attained.

This modified coupler is being used at KN3BZI to load a new 40-meter vertical and the results indicate that the modification was well worth the little effort involved.

— Walter J. Bannister, KN3BZI
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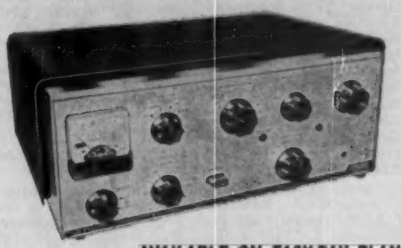

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I.A.R.U. News

(*Continued from page 65*)

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Portugal: Rua de D. Pedro V., 7-4°, Lisbon
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Correspondence From Members

(*Continued from page 94*)

the best group of OM and YL Technicians you could ask for plus the fact we have the largest and most efficient emergency net (Tarrant County Six Meter Emergency Net) that has ever been in this part of the country; past, present and probably future. — *Eddie Kuykendall, W5UXP*

23305 Churches Road
Detroit 41, Michigan

Editor, *QST:*

The "Video Ranger" is your responsibility. The FCC has authorized you to officiate at his license test and check his code speed to see if he will qualify as a Technician. If there are any Technicians operating at the present time who are not qualified, or lack the knowledge of c.w. (5 w.p.m.), or are ignorant of our amateur radio laws, it is because some one of your own class proved himself not qualified to perform this important task in the first place.

My suggestion to all of the General and Advanced Class operators is this: clean your own house first, instruct the Technician applicant of his obligation at the time you officiate at his test. Don't give the applicant the benefit of any doubt; conduct an honest test. This may keep the "playboy" off our 50-Mc. band and leave room for some serious Technicians to pursue their radio hobby to its extreme. — *George Squires, W8SDK*

DXCC

Mullin Lane
Wilmington 3, Delaware

Editor, *QST:*

I think it would be nice if we had DXCC for all c.w. DXCC for all a.m. phone, DXCC for all single sideband, and DXCC for all single-handed.

— *Joe Gillson, W8GAU*

QRU?

Box 485, Linfield College
McMinnville, Oregon

Editor, *QST:*

Are people who check into nets with negative traffic engaged in some sort of a business like selling short in the stock market? — *Ed G. Dolan, K7AAW*

FEEDBACK

In "An All-Electronic Key and Keyer," by Jack Livingston, K2POO, October 1958 *QST*, on page 28, L_1 should be listed as a Stancor A3850 or equivalent.

IMPORTANT NEW BOOKS

UNDAMENTALS OF TRANSISTORS (2nd edition) *by Leonard M. ragman, P.E.* This, the second edition, (revised and expanded) odernizes the highly successful and popular first edition, so as embrace the latest developments in the transistor art. #160, .50

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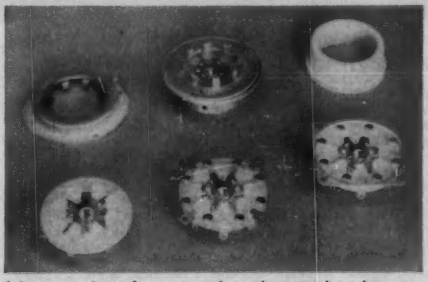
• New Apparatus

Johnson Sockets for External Anode Tubes

A CONSIDERABLE item of expense in the construction of equipment using external-anode tubes such as the VX150A and 4X250B is the socket required. Because of the special by-passing and cooling problems encountered with these tubes, a socket suitable for them is necessarily somewhat complex and costly. A new line of sockets introduced by the E. F. Johnson Company offers amateurs opportunities for savings in certain applications for tubes of this type.

One convenient form, the 124-107-1, lower right, consists of the basic socket in a lightweight silver-plated mounting saddle. The cathode terminals are insulated from ground. The No. 124-108-1, not shown, is similar except that the cathode terminals are inherently grounded.

The simplest and least expensive socket is the No. 124-109-1, shown at the lower left in the photograph. This is the basic socket only, without the mounting saddle, and with no provision for grounding the cathode terminals automatically when the socket is mounted in place. This



Johnson sockets for external-anode tetrode tubes are available in several forms. By-pass assembly, upper left, and chimney, right rear, may be added as accessories.

part is built into the No. 124-110-1 assembly, upper center, which includes a low-inductance 2700-$\mu\mu$f. by-pass capacitor in the silver-plated housing. Spring tabs contact the screen ring of the tube at eight points. This complete assembly is available with insulated or grounded cathode terminals, Numbers 124-110-1 and 124-112-1, respectively. The latter is not included in the picture.

Part No. 124-113-1, upper left, is a separate by-pass capacitor assembly for use with the 124-107, 108, 109 and 144-1 sockets. Its built-in screen bypass has a capacitance of 1450 $\mu\mu$f., tested at 1000 volts d.c. The No. 124-114-1, lower center, is the same as the 108, except that it has the low-inductance grounding on the cathode terminals, Pins 2, 4, 6 and 8.

A chimney of heat-resistant steatite, No. 124-

(Continued on page 194)

ADVENTURES IN ELECTRONICS

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Gene is one of more than 3,000 engineers and technicians assigned to vital electronic installations throughout the free world. These TechReps, performing engineering and maintenance services on world-wide communications systems, early warning radar networks, field testing and instrumentation of offensive/defensive missiles and systems, are already on the ground floor of tomorrow's important satellite programs. As with other TechReps, Chmielewski's stateside and foreign assignments have led him into areas and avenues of interest seldom explored by desk-bound engineers.

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111-1, right rear, is available for use with these and other types of sockets. It directs the air flow through the fins in the external anode assembly, for most effective cooling.

This choice of socket assemblies and components makes possible the use of the simple and relatively inexpensive basic sockets for many applications where the by-passing ring and other features of the complete assemblies may not be required. Examples would be audio equipment and r.f. uses where extremely low-inductance screen by-pass leads are not vitally important.

—*E. P. T.*

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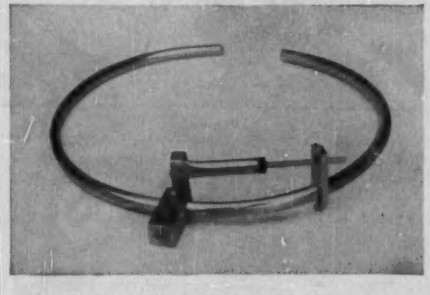

The feedline may be coaxial line of any size or impedance. Matching is by means of a coaxial variable capacitor and an adjustable clamp between the capacitor arm and the driven element. The position of the gamma clamp is set for 52 ohms at 145 Mc., at the factory, but readjustment for other line impedances or different operating frequencies is a simple matter if one has an s.w.r. bridge. The 145-Mc. setting is close enough for good operation over at least the lower half of the band.

—*E. P. T.*

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(*Continued on page 196*)

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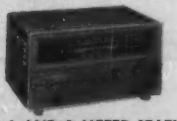

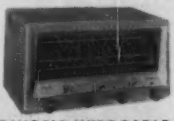

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MODEL 242 FOR 6 METERS OR 2 METERS — 45 WATTS INPUT — 6146 FINAL. Complete with mobile connections, A.C. power supply, tubes, xtal. Xtal mike input. Uses 8 mc. xtals or Lettine VFO. Swinging link matches 52 — 300 ohm antennas. Same cab. as 240. $89.95.

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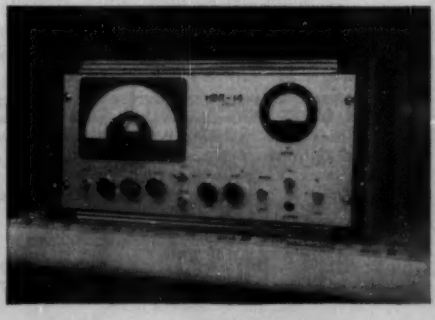
items are shown in the accompanying photograph. The groups at the left and right in this picture also include the standard-size counterparts of the new miniature items, for size comparison. The miniature bar-knob dial at the upper right, for example, is one inch in diameter as compared with 1 5/16 inches for its larger brother; the binding-post assembly is 15/16 inch over-all as compared with 1 1/2 inches for the standard unit; the spacing between terminals in the terminal strips is 3/8 inch in the miniature units instead of 1/2 inch, and similar reductions in the sizes of other components.

A few of the other available small-size components are shown in the center group, including knobs and couplings. The assembly at top center is a dial with a round knob, pointer, and dial lock. The latter operates at an angle to the line of the shaft — a necessity for manipulation unless the hands that operate the miniature controls can be miniaturized, too! Dials and couplings are for 1/8 shafts. In general, the ultimate objective, now near realization, is to make available smaller versions of all the "hardware" of this nature in the Millen line.

Strays

We continue to get quite a number of reports of fellows having built the HBR-14 (described in July, 1957, *QST*). This is a photo of the one put together by K5DJU. He's quite happy with it.



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Yasme II to Aves Island

(*Continued from page 74*)

tion of steel poles and plenty of guy wires but as one could stand here with a six foot pole, lean on it, and sink it right down into the guano without any undue effort it looked like a hopeless effort to bring our poles ashore and even attempt to guy them. I brought over my spinnaker pole, which is about 30 feet long, and we stuck that in the ground, as a shack-side antenna support, and hoped for the best.

A good ground presented problems. Our grounding rod was six feet long and by standing it on the ground it would almost sink and disappear under its own weight. Finally, as we were only a short distance from the beach, we got a length none of us checked, and with a ground which might, or might not, be good, the Onan was started up and we loaded up the HT-32. Within a few minutes of firing up we worked Dick, KV4AA, on 7245, followed by KP4WN, with good reports.

Later we swung over to 14 and 21 Mc. and found both bands fairly good. After one day, however, conditions worsened with some of the heaviest sunspot activity of this cycle and sometimes we wondered if the rig was actually working.

I tried to organize some sort of schedule for the lads so that each of us would have a fair go at the rig but weather conditions got so bad that I was forced to spend most of my time aboard *Yasme* taking care of her. We were anchored in 20 feet of water and for safety sake I had let out the entire 60 fathoms of anchor chain. To augment this I also put out another anchor with 3 inch rope but the coral soon cut through this rope and left us swinging to a single anchor. Several times I had the engine running to ease the strain on the anchor. On the Sunday evening, prior to our departure, the anchor chain snapped. Luckily, I was aboard at the time.

Our stay was now drawing to a close. Conditions had hardly been 100% but we had covered two week ends and I thought it high time to pull out in case the weather worsened and we were forced to leave the gear ashore. I told Dick that we would get QRT at midnight, Sunday (July 13) and load the gear on board at daybreak Monday morning. At around 9 P.M. Sunday we worked W4SRT, after which, the band packed up completely. Repeated CQs went unanswered and as we were all a little anxious about the weather, which seemed to be closing in fast, we decided to pull the big switch.

The HT-32 and SX-101 each took a separate trip out and we managed to get them aboard. Finally came the Onan which was another kettle of fish, being so heavy. It took all four of us to get that dinghy into deep water with Jules and Julio swimming alongside to keep it steady! Once in the clear, they managed to get it aboard. By this time the seas were building up again but, to make it brief, with a combination of

(*Continued on page 200*)

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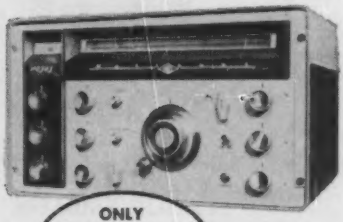

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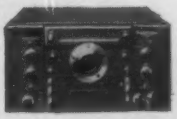

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split timing and lassoing, we got it on the *Yasme's* deck with only slight damage to the paintwork. We all breathed a little easier then and I was grateful for my decision *not* to take the HT-33 ashore earlier.

I then took the dinghy ashore for its last trip, to pick up Falke. As I came in to land a huge roller capsized the whole thing on the beach breaking an oar and the seat. Fortunately the outboard motor escaped damage except for a lifting clip which was snapped off. With Falke aboard, and with one oar, I was lucky to clear the beach and our last and final trip back to *Yasme* was completed without further bother. Once more we set sail. The day passed fitfully and gradually a very unwelcome night fell on us. At least we could not see the threatening clouds and it gave us a false sense of security.

First, out of the black sky, came the lightning. This was no ordinary flash. It struck the water no more than 100 yards from the boat. The discharge gave off an explosion which no half dozen jet bombers, breaking the sound barrier, could imitate. The pungent smell of the charge permeated the boat and I sat there, trembling with fear. How lucky we had been I shall never know. My whip antenna, sticking up over 80 feet from sea level and the long wire, strung between the two masts, were not grounded and, at that time, Jules was in QSO with KV4AA. I shot below and yelled to Jules to shut down the rig pronto . . . maybe next time, if there was a next time, we might not be so lucky. With a full drum of gas, lashed near the base of the mast, a direct hit of lightning could have been quite messy!

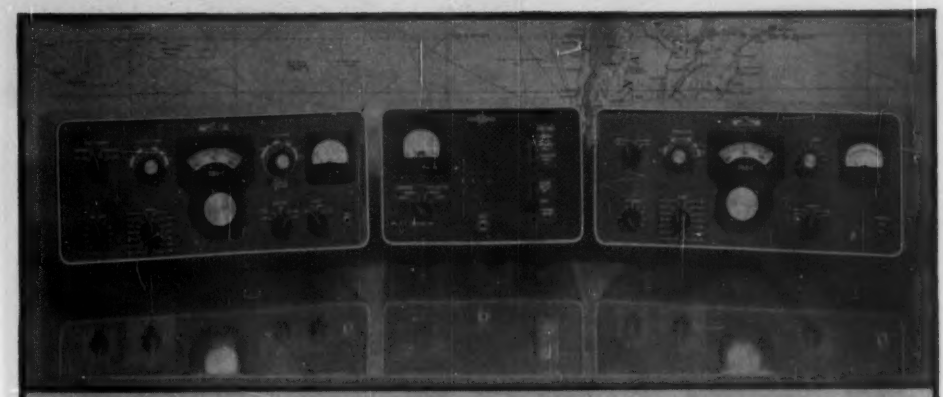
Directly after this a rain squall blotted out everything and it became as black as the insides of a whale. The squall died and for a few moments a deathly calm settled around us. The seas had gone mad, peaking up and falling all over themselves. *Yasme* bounced and fell in to the troughs, her two tiny sails useless. The heat became more oppressive and I sat there with Jules sweating with the anticipation of what would come.

Then it came. First the wind gradually built up and with it the rain. No actual drops were discernible as it came down solid. The wind increased in fury and I scrambled onto the after deck to let the mizzen sail drop. I sent Jules below and had him close the hatch astern. He was too late. The wind had come around to the stern and solid water poured into the after cabin. Finally he got the hatch closed and I threw the auto-pilot out of gear and tried to get *Yasme* around to head into the wind. I didn't dare let her run before this hurricane wind with St. Croix, and its dangerous reefs, only a few miles off.

I had the depth indicator running and I tried hard to keep the boat clear of the shallows never bothering to even look at the compass. The indicator's tiny flash of light wandered around the dial sometimes reading 70 feet and at others only 30 feet.

As quickly as the wind had come, so it left us.

(Continued on page 202)



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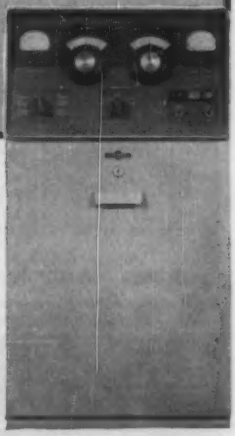

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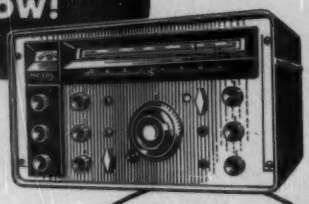

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The loom of lights from St. Croix blinked through the slight drizzle of rain and became clearer as the rain stopped. I put *Yasme* back on course and we both looked around for the lighthouse which, only a short time ago, was dead ahead. It had vanished and I suggested to Jules that it might have been put out of commission by the force of the wind. The lights ashore were no guide but the depth indicator showed depths varying from 20 to 40 feet and I knew we were in too close. The soundings on the chart gave me little help until Jules called down to me that he had sighted a white and GREEN flashing light, dead ahead.

I shot up into the cockpit and swung *Yasme* out to sea immediately. We were heading directly into a large fringe of reefs immediately in front of the air beacon light. Somehow we had been blown to the center part of St. Croix and had managed to avoid disaster only by using the depth finder. Checking the chart I found that present sounding tallied with the ones on the chart and that we had been blown 12 miles east of the lighthouse we had been aiming for originally!

I headed *Yasme* due south until we got "no bottom" on the depth recorder. Then, heading west for an hour we again picked up the lighthouse on the SW tip of St. Croix. Hauling up the mizzen sail again, to steady the boat in the rough seas, we slowly plugged around the point into Fredericksted roadstead.

It was then 3:30 A.M. Tuesday morning and I was pooped. I brewed up some coffee and Jules and I sat on the cockpit enjoying a well-earned rest. Julio and Falke had slept through the lot and were completely unaware of our previous troubles!

At 4 A.M., I managed to make rough repair to a broken jib sheet and we hauled up anchor, started the engine and departed on the last leg of our journey, 40 miles to St. Thomas. The 40-mile crossing was uneventful.

To sum up, we worked 2346 stations in 84 countries. All the equipment survived that trip as proved by subsequent activity at VP2VB and VP2KF and is still going strong. Seems as though the gear will outlast me the way I feel now!

Strays

Last July the MIT radio club laid claim to being the oldest in the country. We have heard from K2LWQ, president of the Columbia University Amateur Radio Club (W2AEE), that he has documentary proof that the Columbia University club was in existence in 1908, and that there is some evidence that it may have been formed in 1906.

—...—

By the time you read this, Sweepstakes will have come and gone. As we write, we're still stringing antennas. Just remember to get those logs in the mail by December 3, 1958.

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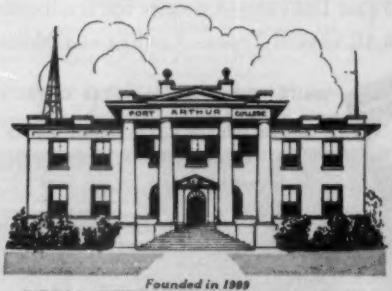

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Pole to Pole on 40 Watts

(Continued from page 79)

Special mention must be given to K2KGJ, K2KGH, W2KCR, W2VH, K1NAP, K5JLQ, W6QPI, W1RST, and W8JYJ, who worked us every day and directed others onto our signal. We could go on — but it would mean copying the entire log book, contact after contact.

It is doubtful whether or not the uninitiated can ever realize the happiness that can be brought or the morale that can be raised by an ordinary hamgram. Only exiles like ourselves can appreciate what amateur radio offers. To watch the smile of happiness, or even a tear or two, on the rugged face of a Sea Bee when he has finished a contact back home, forces one to realize that there is something else in that shiny tin box besides a few tubes and a lot of wire. The operators on both ends of a contact become the confidants of the joys and sorrows, the fears and fallacies, the tears and trifles of loved ones separated for the moment. The operations of service men and scientists away from the States could never be as effectively accomplished without the aid of the hams back home. As is usual, these latter are the unsung heroes of the ionosphere, who report for work or school the next morning, sleepy-eyed and jittery, because they spent all night digging a 40-watt message out of the QRM. Many thanks and God bless them.

KC4USC will be heard again this coming winter; because of the generous assistance of several friends, the 40 watts has been replaced by a full gallon. I hope you work them.

Strays

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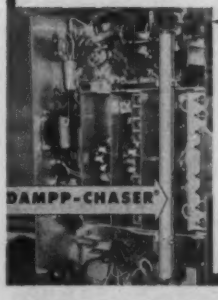

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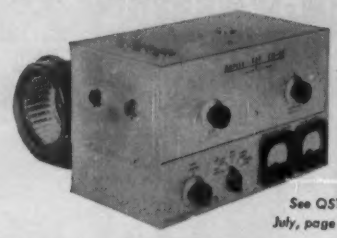
the VHF KW-62



See QST July, page 31

DESIGNED for high efficiency and extreme stability. It can be used in Class C or Class AB1 service. Class C efficiency, 70% to 80%. Drive required on Class C, less than 10 watts.

CONTAINS: Two Eimac ceramic 4X250B's in push-pull; a dual band coaxial grid circuit; separate but readily interchangeable silver plated plate circuits for 6 and 2 meters, a special balancing capacitor to permit balancing of drive on the push-pull grids, a front panel switch to allow grid current or screen current of either tube to be monitored individually; grid/screen meter; plate meter; blower; special air system sockets with built-in screen bypasses, plus other features.

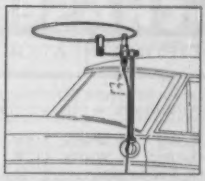
PERMISSIBLE INPUTS: Class C, CW, 1 KW; Class C, AM (plate), 600 W; Class AB1, SSB, 1 KW Single Tone; Class AB1 driver amplitude modulated, 700 W.

Dimensions: 7½" H x 12" W x 14" Deep, incl. blower.

PRICE: KW-62 complete with tubes and blower, your choice of 6 or 2 meter plate circuit, less power supply.....$244.00
Panel model 19" x 8¾".....249.00
Other plate circuit, (so you can work both bands) silver plated, readily interchangeable.....44.50
Power supply.....Price on request

AMPLEX RADIO PRODUCTS, INC.
2072 Portlock, Milford 6, Mich. Phone EM 3-0323

NEW LUNENBURG
2-METER HALO ANTENNA



- Improved Gamma Match feed system
- Built-in coax connector
- Light weight
- May be stacked

Price, **$6.95** less mast
$9.95 with 5' telescoping mast

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MASTER MECHANIC PORTABLE LIGHT PLANTS, PUSH BUTTON START

Item 24

AC Plant 700 Watts — 115 v. 60 cyc. Powered by a rugged 2.2 hp. easy starting Briggs gas engine. No wiring necessary; just plug in and operate. Plenty of current for receivers, transmitters, antenna motors, emergency lights, etc. which require up to 700 Watts. Ideal for radio amateurs, Civil Defense, trailers and camps. Complete with Voltmeter and built-in winding to charge 6 v. auto batteries. **Both engine and generator fully radio shielded. Hams report less hash than on commercial power line.**

Item 24. Wt. 75 lbs. Be prepared if war or storms knock out power lines.....**$143.50**
800 Watt Plant (Item 44) same as above but with larger engine and greater capacity.....**$169.95**
1200 Watt Plant (Item 45) same as Item 24 but with larger generator and engine — 50% greater output **$199.50**

We make all sizes up to 25,000 Watts. Write for information. Send 10¢ for Big New Catalog. Free with order.
Prices f.o.b. factory. Money back guarantee. Send check or M.O.
Master Mechanic Mfg. Co., Dept. I-128, Burlington, Wis.

A Method for Scoring Hidden Transmitter Hunts

BY FRANK A. JEROME,* KICQP

WE HAVE noticed in past issues of *QST* several articles describing direction-finding loops, but even though these activities are popular at hamfests and conventions, there doesn't seem to be much in print on how you score these hidden transmitter hunts. So we thought that some of the readers of *QST* might be interested in hearing how we do it up here in northern Maine.

There are several ways of running the hunt and whichever method you select is strictly a matter of personal pre'erence of the group involved. The prerequisites to any plan are simplicity, good operating practices, and safety. We have settled on the minimum mileage and minimum transmission method of scoring. Each hunter is given one point for each mile that he drives to reach the hidden site. Another point is given to each hunter requesting a transmission from the hidden station. This method of scoring discourages numerous requests for bearing transmissions, and, because there is no time factor involved, it discourages speeding on the road by the hunters. (The first hunter to find the hidden transmitter is not necessarily the winner, you see.)

One of our "must" rules is that there be no trespassing on private property. By sticking with public property (backwoods roads, parks, and the like) we keep out of trouble with property owners. Another one of our rules is that the hidden station must make each of his transmissions the same length. We have decided on a 30-second transmission as the standard — this could be shortened or lengthened depending on your proficiency at taking bearings.

Now for an example of how we do it. It's a nice sunny Sunday afternoon and all stations meet at some prearranged assembly point. The hidden station has to meet here too, because he is the official scorekeeper and must record all odometer readings at the starting line. Once this is accomplished he takes off for the hidden site that he has selected. The gang ragchews on the frequency until the hidden station comes back on the air and announces that he is indeed hidden. While he is announcing this and asking other non-hunters to keep the frequency clear, the first sets of bearings are being taken and the hunters are off. There is no speeding, and no chatter on the frequency. Eventually, however, someone has to ask for a bearing transmission. He pays a point for the service, but lessens the possibility of cov-

(Continued on page 208)

* Box 291, Washburn, Maine.

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EVERY MONTH MORE AMATEURS SEE WARD BEFORE THEY BUY OR TRADE—THERE *MUST* BE A REASON!

Collins 75S-1 SSB Receiver
Sensitivity—1 uv for 10db S/N
Upper and Lower SSB, AM, CW
Broad Position for AM
Crystal Calibrator
2.1 (furnished) and .5 KC Mechanical Filter
Net Price..... $495.00

Collins 32S-1 SSB Transmitter
175 Watts PEP Input
80 through 10 meters
10 db RF Feedback
Automatic Load Control
Upper and Lower SSB, CW
Net Price..... $590.00

Coming Soon
Collins 30S-1 Linear Amplifier
Conservatively designed for maximum legal power.

Time Payments Arranged at LOW BANK RATES

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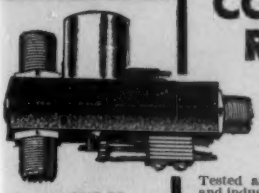

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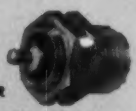
Power consumption, AC models Approx. 4 watts, DC models 3 watts. V.S.W.R. at 150 mc 1.1 and 1.2 at 300 mc. Coil voltages: AC 6, 12, 24, 115, 220; DC 6, 12, 24, 48, 110, 220. Special coil voltages available.

Tested and proven by amateurs and industrials. High contact pressures now made possible with new Dow-Key magnet principle, a new concept of low resistance contact, a new high standard for coaxial relays. Exclusive, patented receiver protecting connector, and heavy duty SPDT or DPDT switches are optional.
PRICES.....10.90 to 14.20

DKC-P PANEL MOUNT UHF CONNECTOR



Needs only one ¾" hole, no screws. Precision made, durable.
Each.....70¢

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A favorite for relays, antenna switches, cables. Durable, silver-plated, locking type.
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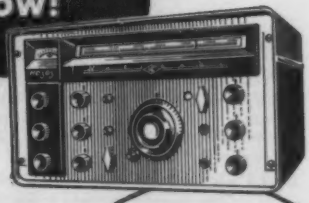

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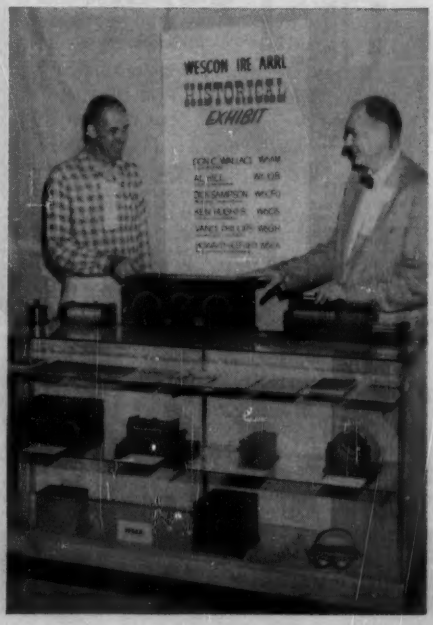
BUG

ering too much distance. Of course, each of the hunters benefits from the transmission, and this is where cunning and cleverness pay off. The hunter must constantly balance his need for a bearing transmission, the point penalty for same, the possibility of excess mileage, and the probability that someone else will soon call for a bearing.

If you ever come up to this neck of the woods some Sunday in the summer and you see a mobile station complete with loop antenna going slowly down the road in reverse gear, you'll know that he has asked for a few too many transmissions and now must concentrate on saving his mileage!

Strays

In the photo below Howard Seefred, W6EA, and Don Wallace, W6AM, are admiring the ARRL Historical Exhibit at the annual West Coast IRE show (better known as WESCON). An extensive display of equipment, some of which was supplied by ARRL headquarters, was assembled by Al Hill, W6JQB, vice chairman of the historical exhibit and ARRL Section Communications Manager of the Los Angeles Section. Among the equipment on display was a Kolster decremeter used for checking spark transmitters in pre-World War I days, the original 1920 KNX and KFI transmitters, the 1926 Rectobulbs used in the 6-phase W6AM rectifier, some Clapp-Eastham equipment of 1913, some Dubilier of 1920, and a whole raft of equipment loaned by W6GH and by W6EA, among others. Incidentally, W6EA and W6AM first worked each other on the air in 1911 using code and in 1913 using phone. There is some indication that W6AM, in particular, is still active.



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From ALL of us to ALL of you

W7EHQ W7MFG W7UYK
W7OVW W7DDQ W7RGD
W7EKW W7UBA K7BHG
W7VXR W7AUG W7BDY
W7JAN W7NZM KN7EJT
K6PBK

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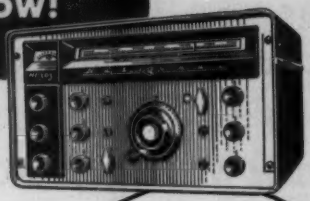

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Highball to Eyeball

Field Day in Motion

BY MARK E. BALLARD,* W9BSZ

WITHIN the past two years Marion, Indiana, has experienced two emergencies of major proportions. In 1956 we were ripped apart by a tornado and during the spring of 1958 we had our worst flood. During these two emergencies we found that our portable equipment was of no use to us. By the time we could set up at one location our services were no longer needed and we would have to move to another location only to find the same situation at the new site. It takes too long to move portable generators and to erect temporary antennas. By the time that these necessary items are secured the urgent communication has already been dispatched by a leather-lunged eager-beaver who shouts at an 88 level or a carrier pigeon has made the trip home, delivered the message and is comfortably pecking at his oat-box.

The state of the art of mobile operation has increased in efficiency to a point where it is easy to communicate ten to twenty miles with ground-wave operation into a fixed station that is outside the disaster area. Thus we are now tossing into the discard the portable idea of operation in favor of the much more useful mobile operation for emergency work. For this reason we have

(*Continued on page 218*)

*721 West Seventh St., Marion, Ind.

Here are the operators who went on the 250-mile jaunt for a Field Day in Motion. Left to right are W9BSZ, W9CVO and W9ZTZ.

SUPERIOR SSB GEAR

NEW 100V EXCITER-TRANSMITTER

NO TUNING (except VFO), uses famous CE BROADBAND system. PRECISION LINEAR VFO—1KC Calibration. Single Knob Bandswitch 80 thru 10. SSB—DSB—AM—PM—CW and FSK. RF Output adjustable 10 to 100 Watts PEP. Meter reads Watts Input, Amps Output and Carrier Suppression. 2" RF Scope. Speech Level and Load Mismatch Indicators. Audio Filter — Inverse Feedback — 50 db Carrier and Sideband Suppression.

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MODEL 10B — 10 watts PEP. Plug-in coils 160 thru 10 meters. Perfect voice control on SSB—DSB—AM and PM — CW breakin. Carrier and calibrate level controls. 40 DB suppression.

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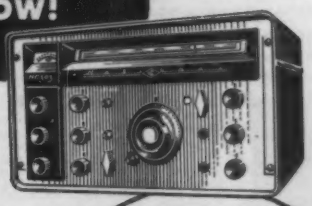

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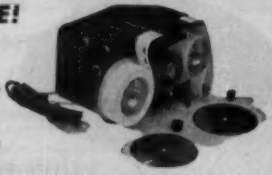

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changed our field day operation into a roadway day excursion.

Here in Indiana we have a network of base and mobile stations using commercial type n.b.f.m. equipment on 147.3 Mc. Nearly every county has at least one base station and a number of mobiles in addition to which the Indiana State Police posts are also equipped to carry on two-way communication as long as an amateur radio operator is on duty at the police post. These units are a fundamental part of our Civil Defense communications system.

On this roadway trip we used an n.b.f.m. unit on 147.3 Mc. in addition to a Gonset Communicator III for our mobile station. During our 250-mile highball we made seventeen contacts. This trip took only seven hours. We felt our results

(*Continued on page 214*)

The Kokomo gang was too busy making contacts to turn around for a mug shot. They piled up an impressive score on Field Day.

The Cass County group had their setup in a corncrib. Operators shown are K9GMH, K9AWH and K9HFC.

BANDMASTER Z-MATCH
EVERYTHING YOU'VE EVER WANTED IN AN ANTENNA COUPLER

4 INSTRUMENTS IN ONE UNIT

1. Antenna Matching Unit
2. Forward-Reflected Power Wattmeter
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The Bandmaster Z-Match Antenna Coupler, featuring the improved M. C. Jones Micro-Match Circuit, is a combination antenna matching device, 50 ohm Dummy Load, R.F. Wattmeter, and Forward-Reflected Power Meter, designed to provide high efficiency antenna matching.

The tuning arrangement covers from 3.5 to 30.0 megacycles, while matching a 50 ohm input to reactive and non-reactive loads from 10 to 2500 ohms without switching coils. The R.F. Wattmeter is in the circuit at all times, and the Dummy Load may be used to tune your transmitter before going on the air, in accordance with F. C. C. regulations. The Micro-Match circuit is built-in, with a panel switch to read Forward or Reflected Power.

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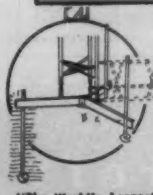

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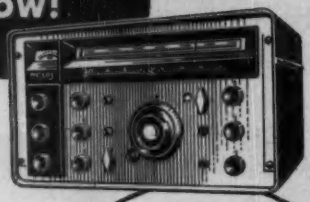

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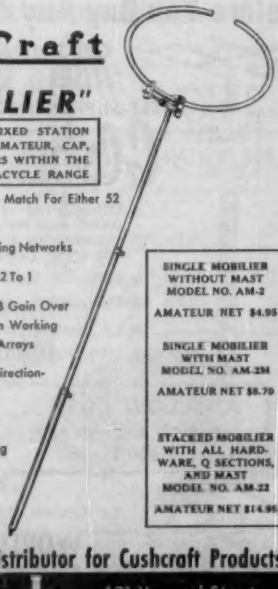

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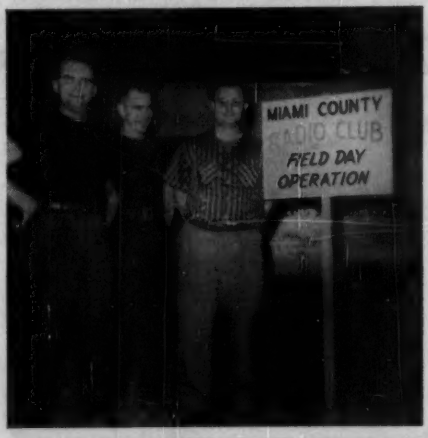
The Engineering Department of WANE-TV at Fort Wayne was very hospitable. K4BTN/9 is shown operating from a small tent in the middle of a mosquito field.

At Peru, we got three members of the Miami County Club together for a snapshot: K9ACR (prexy), K9IOO and K9GPQ.



were quite good considering we were using a whip on 6 meters and a fixed-frequency transmitter and receiver on 147.3 Mc. Now that we have gotten our feet wet with this kind of operation we are making plans for a more elaborate roadway operation next year.

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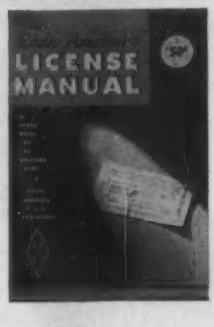

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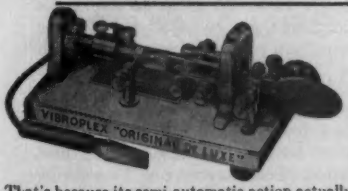

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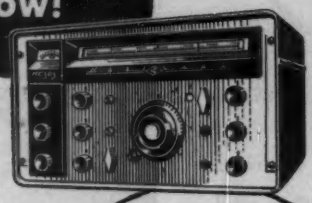

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V.H.F. and U.H.F. Reception

(*Continued from page 31*)

result for a perfect receiver or 0-db. noise figure. Note how a small reduction in noise figure is increasingly important at the higher frequencies.

Fig. 3, it should be pointed out, is based on average cosmic noise (Fig. 1), and therefore does not represent the best conditions. Also, there are certain other limiting effects that must be considered in a practical case and which cause the two lower curves of Fig. 3 to level off rather than to continue downward as does the cosmic noise curve.

First is line loss; you simply can't afford to have very much. Anything that dissipates power also contributes thermal noise. This leads us to consider the use of pole-top front ends or, at u.h.f., waveguides. Also, we must take into account the effects of atmospheric absorption — its attenuation contributes some thermal noise. For the conditions assumed in Fig. 3, it becomes severe only above about 1000 Mc. Solar noise can be overwhelming when we are dealing with low levels and we must avoid the sun with our antenna beam. Hotspots of cosmic noise (radio stars) should also be avoided. Ohmic losses in the antenna must also be minimized due to their resistive noise.

Perhaps the most serious of all is the effect of the ground in front of the antenna. If it is a perfect reflector, there is no problem as it can contribute no noise. However, there is always some loss from ground reflection. This loss looks like a room temperature attenuator and contributes noise. (It is of interest to note that horizontal polarization gives considerably less ground noise contribution than vertical.) The best way to beat it would be to simply have a perfect ground, such as a copper sheet two miles across! If this is not feasible, the next best thing is to tilt the beam up away from the earth; fine for lunar and high-angle meteor work. However, for tropospheric scatter, you will take a beating in doing this because of the increased scatter angle. Even with the antenna tilted up so as to avoid the ground in the main lobe, we still expect some additional noise from side and back lobes which illuminate the "noisy" earth.

Fig. 3 was computed on the basis of representative values of these factors that might be experienced in a typical case.

It is also of interest to consider the best possible situation. This corresponds to viewing the coldest portion of the sky and operating with the antenna tilted up from the ground to eliminate the main-lobe ground contribution and the majority of the atmospheric loss. The over-all effective noise figure under these conditions is shown in Fig. 4 for a zero db. noise figure receiver. It can be seen to represent improvement over present equipment of 3 db. at 144 Mc., 6 db. at 220 Mc., 12 db. at 430 Mc., and 15 db. at 1300 Mc. At 144 Mc., this improvement may be just enough to put us in business with regular moon-bounce contacts. It also corresponds to

(*Continued on page 218*)

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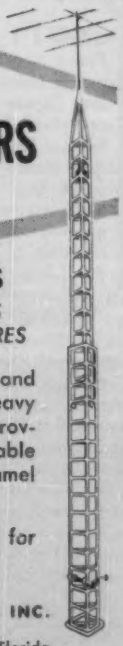

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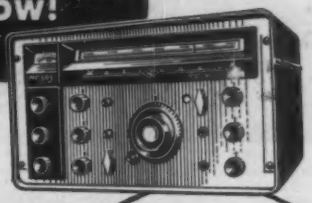

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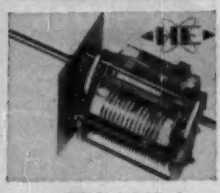

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doubling the burst rate observed in meteoric work.

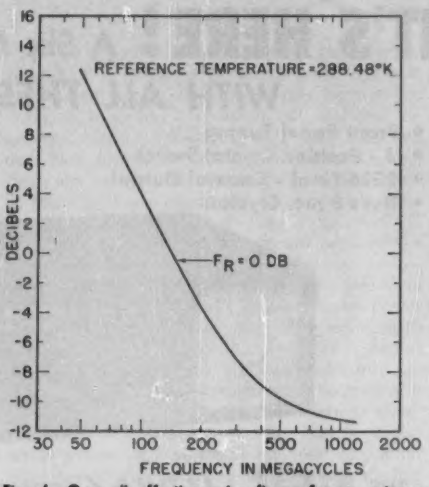

Fig. 4—Over-all effective noise figure for an antenna pointing at a "cold" region well above the horizon.

At the higher bands, the improvement is considerable. The table below takes this improvement and translates it into what may be expected on tropospheric scatter, meteor rate, and lunar echoes, for the power and antennas indicated. It is assumed that c.w. is used with narrow-band receiving techniques.

	220 Mc.	*432 Mc.*	*1300 Mc.*
Antenna Power	150 w.	150 w.[2]	150 w.
Antenna Gain over Dipole	24 db. (24′ dish)	23 db. (17′ dish)	27.5 db. (9½′ dish)
Tropospheric[3] Scatter Range	425 mi.	440 mi.	365 mi.
Meteor Rate	1.8/min.	0.9/min.	0.13/min.
Moon Echo, add'l. system improvement required	7 db.	1.5 db.	0 db.

For power outputs of 150 watts and modest size antennas, we find that consistent tropo-scatter ranges of nearly 400 miles are to be expected on all three bands. Meteor rates, although dropping rapidly, still indicate about one burst every 7–8 minutes at 1300 Mc. Moon echo work may just be feasible at 1300 Mc. as the calculations indicate it is on the ragged edge. Increases in power and antenna size beyond the values indicated should make these higher frequency bands even more attractive. It is evident that with the very low noise figures which are now within reach in amateur practice, performance may be expected on the higher bands that equals or exceeds that on 2 meters.

[2] Of academic interest only due to the present 50-watt limitation.

[3] For tropo we are forced to beam toward the horizon and hence accept some degradation due to ground noise in the main-lobe and atmospheric loss. This is significant only on 1300 Mc., however.

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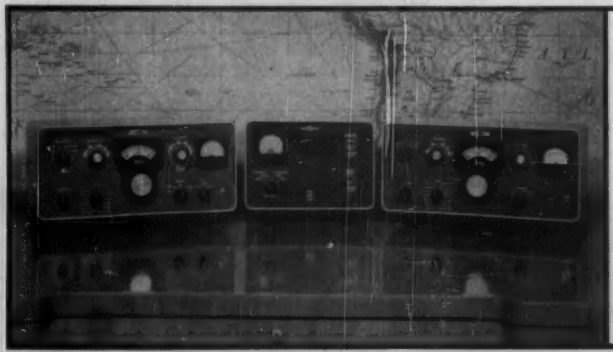

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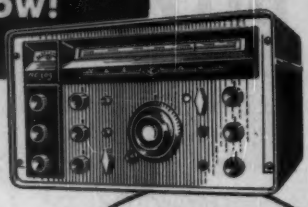

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What Is A DXer?

BY PAUL AMIS,*[1] W7RGL

BETWEEN the innocence of a Novice and the dignity of the Traffic Man we find a harassed creature called the DXer. DXers come in assorted sizes, modes, and powers, but all DXers have the same creed: to work DX every second of every minute of every hour of every available day and to protest with higher power (their major weapon) when the band starts to fold and ionospheric punishment finally shoos them up to 75 meters.

DXers are found everywhere — on top of, underneath, barely inside of, sliding into, drifting out of, or switching to.

Beam manufacturers love them, rag-chewers hate them, DX tolerates them, traffic men ignore them, and heaven protects them.

A DXer is skill with a chirp, concentration with a cigarette glued to his lip, superstition with a text book, and a fount of technical know-how with a touch of TVI.

When you are rag-chewing, a DXer is an inconsiderate, bothersome, intruding jangle of QRM. When you succumb to working the "buddy system" with him, his brain turns to jelly, or else he gets his finger stuck in the bug. When you've given up in disgust and tuned elsewhere, he'll operate like a demon, tail-end like a pro, and come up with seven new ones in exactly 27 minutes flat.

A DXer is a composite — he has the memory of a UNIVAC, the shyness of a pile-driver, the strategy of Halsey, the energy of an atomic bomb, the stealth of a cat, the lungs of a dictator, the audacity of a steel trap, the enthusiasm of a fire-cracker, and hasn't been to a motion picture in years.

He likes 20 meters, coffee, hilltops, winter, beams, big tetrodes, ten-acre farms, the mailman, swivel chairs, *QST*, women (occasionally), Saturday mornings, maps, band-edges, pilot lights, and sunspots. He's not much for rag-chewing, dipoles, kids in the shack, s.w.l.'s, low-level modulation, apartment houses, OOs, channel two, Field Day, novices, or traffic.

Nobody else is so early to rise, or so late to work.

Nobody else gets such a thrill out of fluttery signals, T7 notes, heavy accents, or 100 confirmed. Nobody else can cram onto one operating table a jar of dull pencils, three issues of the *Call Book*, half a cup of cold coffee, a screwdriver, a time-zone converter of dubious accuracy, a log book (badly smudged), the last two years of *QST*, an 19-inch line of cigarette burns, a war-surplus key, five pieces of wire, an OO report, 468 blank QSL cards, two full ash-trays, a 1949 edition of the *Antenna Handbook*, a chrome-plated mike,

(*Continued on page 222*)

*Rt. 1, Box 438, Poulsbo, Wash.

[1] With apologies to Alan Beck and "What is a Boy?"

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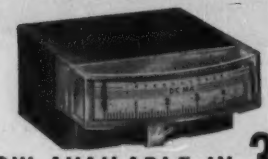

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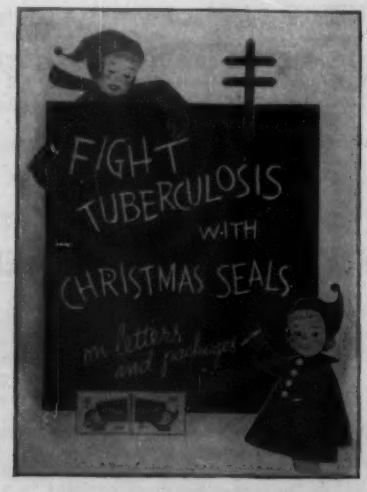
A DXer is a magical creature. Atmospherics can drive him from 10 meters, but it can't keep him from peering under the third layer on 40. You can forbid his 80-foot tower in the back year, but you can't stop him from working DX.

You might as well give up — you can't get rid of his ear-shattering note on c.w., or his punch on phone . . . a baggy-eyed, stubble-chinned, tuned-to-the-band being, with a callus on his sending elbow.

But when the advancements of this hectic hobby start getting us down; when the rigors of TVI, transmitter efficiency, clicks, radiation patterns, chirps, BCI, and neighbors begin making the game not worth the candle; then you'll find that one of these DXers will come forth, blinking in the unfamiliar sunlight, long enough to share with his unenlightened breathren a scheme, a story, a method, a design, or a system, to help us over the technological hurdles modern electronics and jam-packed bands has set before us. And, after planting this 24-carat nugget in the unploughed field of the average ham's mind for the inestimable good for all, he will peer into the western sky and scratch, sniff the air a few times, and know from the feel of things that *this* night, of all nights, will be good for DX.

Strays

At the 10th ARRL National Convention in Washington, August 15–17, several amateurs were cited for their assistance to the military. Here the Air Force's choices receive presentation microphones from Gen. Curtis LeMay, Vice-Chief of Staff, USAF (and K4RFA!). Left to right, K4KCV, K4RFA, W9NZZ and W3IYX.



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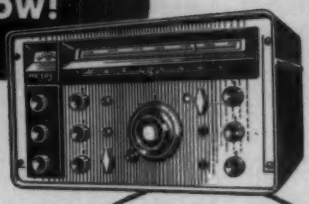
Radio Servicing • **Television Servicing** •
Preparation for Civilian, Maritime, Army and Navy License requirements
Write for information on these courses to:
BROOKLYN Y.M.C.A. TRADE SCHOOL
1115–1119 Bedford Ave., Brooklyn 16, New York

IN STOCK NOW!



NATIONAL'S NEW
NC-303

TOP TRADE-IN ALLOWANCES
LIBERAL BUDGET TERMS

HENRY RADIO STORES
11240 W. Olympic Blvd.
Los Angeles 25, California

SEE National's advertisement on inside back cover of this magazine

EASY TO LEARN CODE

It is easy and pleasant to learn or increase speed the modern way — with an **Instructograph Code Teacher**. Excellent for the beginner or advanced student. A quick, practical and dependable method. Available tapes from beginner's alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready, no QRM, beats having someone send to you.

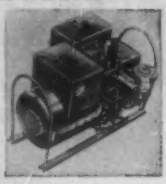
ENDORSED BY THOUSANDS!

The Instructograph Code Teacher literally takes the place of an operator-instructor and enables anyone to learn and master code without further assistance. Thousands of successful operators have "acquired the code" with the **Instructograph System**. Write today for full particulars and convenient rental plans.

INSTRUCTOGRAPH COMPANY
4709 SHERIDAN ROAD, CHICAGO 40, ILLINOIS
357 West Manchester Ave., Los Angeles 3, California

PORTABLE POWER PLANTS

Push Button Start—115 V AC (& 12 V DC) Always available.



Be prepared with reliable emergency power, designed for use with radio gear, etc. Only unit at these low factory prices fully shielded and filtered for radio, and individually checked by scope. Not surplus, but brand new 4 cycle, easy starting, cast iron cylinder engines, fiber glass insulated generators, and control boxes with voltmeter and controls. Conservatively rated. Just the generator for CD, Field Day, Camping and Boats. Complete line. Fully guaranteed.

700 watt (A712) Shpg. wt. 77 lbs. $143.50
1000 watt (A1012) Shpg. wt. 90 lbs. $195.50
2500 watt (A2512) Shpg. wt. 225 lbs. $325.50
Sizes to 3500 watts. Dual voltage models, automatic controls, etc., available. Write

GENERAL ELECTRONIC SERVICE CO.
P. O. Box 9 ROckwell 3-2425 Burlington, Wisconsin

NEW! . . . 60-ft. 4-BAND ANTENNA
TUNES 40-20-15-10 METERS

Same Hi-power design except 4 bands in 60 ft. over all. Tested at 10,000 KV RF. Will handle 2 KW of well overmodulated AM. Only coils guaranteed to take a KW on the market.

Available for immediate delivery

40M-C 4 band KW coils $14.95
40M-A 4 band KW antenna $24.50
All antennas have 88 ft. KW twinlead, heavy duty insulators, copperweld wire.

FIVE BAND ANTENNAS STILL AVAILABLE:

HC-F 5 band KW coils $19.95
HA-F 5 band KW antenna $33.95

Improved quarter KW 5 band models:

5 BC-F phone coils; 5BC-C CW coils $12.50
5BA-F phone; 5BA-C CW antennas $27.50

Precision quartz crystals — High Frequency and Low Frequency available in your most exacting and specific requirements. Close tolerance quartz crystal blanks and plates. Transducers for Ultrasonics. Crystal Ovens to give precise frequency control = 1° C. at setting. We invite you to bring your crystal problems to our attention. Catalog Q-12 available upon request.

Postpaid in U.S.A.

MONEY BACK GUARANTEE

GENERAL CRYSTAL COMPANY, INC.
372 Wilmot Ave., Burlington, Wis.

In the GULF COAST area
Grice Electronics
is the place to buy
Collins Equipment

now on display
COLLINS S/LINE
and a complete stock of all Collins accessories.

Liberal trade-in allowances.
Convenient Time Payment Plan.

GRICE ELECTRONICS, INC.
300 E. Wright Street
PENSACOLA, FLORIDA

NATIONAL'S NEW
NC-303

TOP TRADE-IN ALLOWANCES
LIBERAL BUDGET TERMS

WALTER ASHE RADIO CO.
1125 Pine Street
St. Louis 1, Missouri

SEE
National's advertisement on inside back cover of this magazine

"Mage" Magers
WØOJI, President
A Ham Since 1910

Not the CHEAPEST, but the BEST!

VESTO'S
Hurricane-Proof*
Self-Supporting
TOWER

A Galvanized Tower that will last a lifetime.
Ten sizes to choose from! 22 ft. to 100 ft.
Easy Terms Available

VESTO TOWERS HAVE: No guy wires! No cables! No moving parts!

VESTO TOWERS OFFER YOU:

- 4-leg construction for better balance—greater strength
- Safe, steel ladder from ground to platform near top
- Safety platform with metal railing and trap door (optional)

PLUS VESTO'S NEW Geared Crank-Over Antenna Head

Now! Tilt antenna for easy accessibility! Tilts heaviest antennas! Holds in any position!

*NO VESTO TOWER HAS EVER BEEN DAMAGED BY HURRICANE

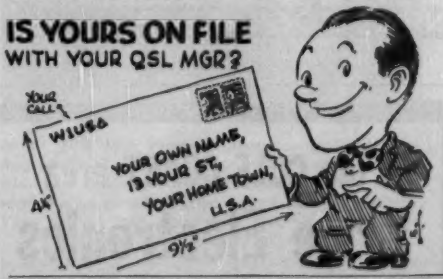
Easy Payment Plan! Write for complete FREE information

VESTO CO., INC.
20th & Clay St.
North Kansas City, Mo.

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.
W2, K2 — North Jersey DX Association, Box 55, Arlington, New Jersey.
W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Robert Stark, W5OLG, P.O. Box 261, Grapevine, Texas.
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount Avenue, Oakland, Calif.
W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.
W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.
WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.
VE1 — L. F. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — George C. Goode, VE2YA, 188 Lakeview Ave., Pointe Claire, Montreal 33, Que.
VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 833 10th St., North Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.
VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.
VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.
VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.
KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.
KL7 — KL7CP, 310–10th Ave., Anchorage, Alaska.
KZ5 — Catherine How, KZ5KA, Box 407, Balboa, C. Z.



ETCHED CIRCUITRY EXPERIMENTERS

No photographic, silk screen or mechanical film processes required; use only a few common household materials.

One 5" x 6" piece XXXP-36 phenolic sheet copper-faced on one side, etching chemical and instructions only: $1.00 postpaid.

8" x 10" XXXP-36 phenolic sheet copper-faced on two sides, per sheet only: $1.00 postpaid; with etching chemical and instructions: $2.00 postpaid.

Write CIRCUITRY
P.O. Box 4444
Tucson, Arizona

CLOSE OUT . . . $389.00

Another company made a substantial down payment on this complete Gates 50 watt phone and CW transmitter with Hallicrafters S-85 receiver. They ceased business before delivery was made and it is your savings. Continuously variable, 2–32 Mc. Includes tubes, microphone, receiver — everything except crystals.

This package normally nets at $704.50 and is yours complete at **$389.00.** Only 17 available. Ideal for any communications need. Cash with order, F.O.B. Quincy, Illinois. If sold out, checks returned same day. Wire orders protected 72 hours against receipt of check.

GATES RADIO COMPANY

Subsidiary of Harris-Intertype Corporation

QUINCY, ILLINOIS, U. S. A.

ONLY $18.00 plus 10% Fed. Tax

24-HOUR DIAL ELECTRIC CLOCK

Big 15" illuminated dial for easy reading. Handsome and durable with glass crystal, aluminum case and stainless steel bezel. Ideal as a gift.

SEND CHECK OR MONEY ORDER TO:

SCIENTIFIC INDUSTRIES, Inc.

23 Park Street, Springfield 3, Massachusetts

or write for Free Literature

THE MOST PROFITABLE QSO I EVER HAD!

It was a solid, arm-chair-copy QSO with a W7—who told me how he had turned ham radio experience into a high-paying career: installing and servicing commercial and public-safety 2-way radios. He said he'd started by answering a Lampkin Laboratories' ad in QST.

After we had passed along our 73's I found the Lampkin QST ad—and filled in the coupon. It brought me my free copy of **"HOW TO MAKE MONEY IN MOBILE-RADIO MAINTENANCE".** From this booklet I learned of the high income I could earn in this field—and why it is a perfect business for hams.

Now I have contracts that pay me plenty, each month—thanks to a QSO . . and a coupon!

LAMPKIN METERS ARE USED BY THOUSANDS OF MOBILE-SERVICE ENGINEERS

LAMPKIN TYPE 105-B FREQUENCY METER
RANGE 0.1 TO 175 MC AND UP
PRICE $220.00 NET

LAMPKIN TYPE 205-A FM MODULATION METER
RANGE 25 TO 500 MC
PRICE $240.00 NET

LAMPKIN LABORATORIES, INC., BRADENTON, FLA.

HERE'S THE SAME COUPON
BETTER MAIL IT TODAY!

LAMPKIN LABORATORIES, INC.
MFG. DIVISION, BRADENTON, FLORIDA

AT NO OBLIGATION TO ME PLEASE SEND ME FREE BOOKLET AND DATA ON LAMPKIN METERS.

NAME_____

ADDRESS_____

CITY_____ STATE_____

May I Recommend THESE GREAT BEAMS from hy-gain

SAYS LEO I. MEYERSON, WØCFQ, WORLD RADIO PRESIDENT

WE CARRY THEM ALL IN STOCK AT

"the house the hams built!"

PERSONALIZED SERVICE

GUARANTEED SATISFACTION

EASY TERMS | **TOP TRADE-INS**

PROMPT SHIPMENT | **LEADING LINES**

FREE 1959 CATALOG

Jam packed with bargains — everything in Radio, TV, and Hi Fi — for Handyman, Ham, Experimenter or Serviceman!

Send Your Free Catalog and Complete Information on Entire Hy-Gain Line!

WORLD'S MOST PERSONALIZED RADIO SUPPLY HOUSE

World Radio LABORATORIES

ELECTRONIC HEADQUARTERS

3415 W BROADWAY, CO. BLUFFS, IA., Phone 2-0277

Perfect 1:1 SWR with the NEW hy-gain monobanders

GAMMAXIAL Gamma Match System!

Now a feature of all three monobanders, the new, pre-calibrated (GAMMAXIAL) Gamma Match assembly with coaxially formed reactance cancelling capacitor built-in, makes possible for the first time a perfect 1:1 SWR. Coax connector for 52 ohm feed included. Developed by hy-gain's engineering staff and used exclusively in the hy-gain monobanders.

10M - 3 ELEMENTS

18 lbs.
Boom Length: 194"
Longest Element: 17'10"

$24.95

15M - 3 ELEMENTS

30 lbs.
Boom Length: 142"
Longest Element: 33'10"

$34.95

20M - 3 ELEMENTS

48 lbs.
Boom Length: 212"
Longest Element: 35'9"

$59.95

Carefully engineered, incorporating the latest design principles for top performance, the hy-gain monobanders are factory pre-tuned and pre-matched. Complete with easy-to-follow instructions for assembly, these beams sold with 1 year guarantee. Features include large diameter elements and ruggedly built Boom/Mast clamps. Booms hot dipped galvanized steel for max. strength with minimum wind resistance. Elements 6061T6 alloy. Extremely simple to put up and into operation.

Average Gain: 8½ db. Average F/B Ratio: 24 db.

Q-12

NAME: _____

ADDRESS: _____

CITY & STATE: _____

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communications equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIY, Troy, Ill.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

WANTED: All types aircraft & ground transmitters, receivers ART-13, RT/ARN7, BC610E, ARN6, BC7883, ARC3, BC342. Highest prices possible paid. FOR Action we will buy immediately for cash all types amateur equipment or trade against new amateur gear. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system alternator, regulator & rectifier, $45.00. Also Leece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, $85.00. Good condition. H. A. Zimmerman Jr., K2PAT, 115 Willow St., Brooklyn 1, N. Y. Uister 2-3472.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco Master Mobile Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

WANTED: Receiver R5/ARN-7, MN-62A transceivers, RT18/ARC-1, AN/ARC-3, BC-788C, 1-152C, Collins, Bendix equipment, test sets, dynamotors, inverters. We pay highest prices. Advise quantity, condition, price in first letter. Aircraft Radio Industries, Inc., 70 East 45th St., New York City. Tel. LExington 2-6254.

SAN FRANCISCO and vicinity. Communication receivers repaired and realigned. Guaranteed work. Factory methods. Special problem, invited, any equipment. Associated Electronics, 55 South P St., Livermore, Calif. W6KF, Skipper.

RECEIVERS: Repaired and aligned by competent engineers, using factory standard instruments. Authorised Factory Service Station for Collins, Hallicrafters, Hammarlund, National. Our twenty-first year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

RADIO magazines. Buy, sell or trade. Bob Farmer, Plainview, Texas.

TECHNICAL Manuals TM11-273, 120 pages covering BC-312 receivers and BC-191 transmitters, $2.50. ID-60/APA-10 Panadaptor maintenance manuals, $2.75. Both postpaid in U. S. A. Electronicraft, Bronxville, N. Y.

"PIG-In-A-Poke"? Not if you visit Ham Headquarters, USA, and pick your choice from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-in Center. Greater values, because tremendous turnover means lower overhead! Terms. Trades. Send us postcard for mouth-watering photograph and price-list. For the best in new and used equipment it pays to come to Ham Headquarters, USA! BCNU. Bill Harrison, W2AVA, 225 Greenwich St., New York City.

"THE Saga of Telegraphy", LP recording & brochure. Historical. $3.75. Ralph Graham, W4RJX, Box 3556, Arlington 3, Va.

SALE: NC-188 receiver, new, never used, $120. K2YIC, Wills Alexander, 11-C Hoskins Park, Quonset Pt., R. I. Tel. Wickford 2-1130J.

QSLS? SWLS? Finest and largest variety samples 25¢ (refunded). Religious QSL samples 10¢. Calendars for hams, (1959) QSL size, 50¢: Callbooks (winter) $5.00. "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Mich.

QSLS-SWLS. High quality. Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSLS-SWLS, 100, $2.85 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS, SWL's VHF's XYL-OM's. (Sample assortment approximately 9¾¢). Covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fatabulous, DX-attracting, prototypal, snassy, unparagoned, cards. Rogers, KØAAB, 737 Lincoln Ave., St. Paul 5, Minn. Also glamorous, pulsating (Wow!)

QSLS, Taprint, Union, Miss.

QSLS. Plain and fancy samples 10¢. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

QSL-SWL samples free. Bartinoski W2CVE Press, Williamstown, New Jersey.

QSLS of Distinction! Three colors and up: 10¢ brings you samples of distinction. Uncle Fred, Meshoppen, Penna.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢ with catalogue. 25¢.

QSLS-SWLS. Samples 10¢. Maigo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLS, Sharp! 200 one color, glossy. $4.75 Multi-color samples dime. KØDAS QSL Factory, Edward Green & Sons, 4422 Marquette Dr., Ft. Wayne, Ind.

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life. 48 hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

QSLS, SWLS, Tackards, glossy, colors, 100, $2.75 up. Samples 10¢ refunded. W1GKH Press, 27 Liberty St., Danbury, Conn.

YOUR QSL made into a laminated plywood plaque, $3.00. Satisfaction guaranteed. Solomson, 46 Cornhill, Boston 8, Mass.

QSLS Neat, Attractive. Samples 10¢. Woody's, Box 164, Asher, Sta., Little Rock, Ark.

FREE Samples. QSLS-SWLS. Backus, 703 Cumberland St., Richmond, Va.

COLOR Glamor, scenic & nature. Custom sketch and photo. Samples 25¢ refunded. K4LFZ QSLS, Summerfield, Fla.

RUBBER Stamps! Highest quality, all types, sizes. Write for prices and sample impressions. John Driscoll, W2S8C, 50 Howard, Buffalo 21, N. Y.

QSLS. Reasonable. 3 weeks delivery. Catalog dime (coin). Dick, K6GJM, Box 214, Temple City, Calif.

QSLS. Samples free! Phillips. W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLS. Samples 25¢ (refunded) W6CMN, 6707 Beck Ave., North Hollywood, Calif.

QSLS. Samples, dime. Printex, Corwith, Iowa.

C. FRITZ — QSLS. Sends Season's Greetings to Hams everywhere. May Health and Happiness be yours in 1959!

QSLS, samples dime. Eddie W. Scott, W3C8X, Fairplay, Maryland.

QSLS and SWLS. Send $3.00 for 100 beautiful glossy two-color cards postpaid. David Spicer, 4615 Rosedale, Austin 5, Texas.

QSLS! HighGloss, 2 colors, samples 10¢. K2VOB Press, 62 Midland Boulevard, Maplewood, N. J.

QSLS-SWLS that are different! Colored embossed card stock, and "Kromkote". Samples 10¢. Turner, K8AIA, Box 953, Hamilton, Ohio.

QSLS, plain and fancy samples 10¢. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

RUBBER Stamps for hams, sample impressions, W9UNY, Hamm, 542 North 93, Milwaukee, Wisconsin.

QSLS — Outstanding-Original-Fast Service, reasonable prices. Samples 10¢. Larger Quantity 25¢, refunded. VYS QSLs, 1704 Hale Avenue, Ft. Wayne, Indiana.

QSLS: Cartoons, colors, something different! Samples 25¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

QSLS, SWLS, etc. QSO filers. 10¢ for samples. Onondaga Press, Onondaga, Michigan.

QSLS. Rubber stamps, reasonable, nice designs. Samples, dime. Stan, W2DJH Press, 19 Elm, Warrensburg, N. Y.

QSLS-SWLS. 100, $2.50. Samples 10¢. QSO file cards, $1.00 per 100, Rusprint, Box 7507, Kansas City 16, Mo.

QSLS: 4 colors, glossy, 100, $3.00. Samples 10¢. Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Mich.

S.S.B. xfrmrs, exact set for W2EWL exciter (hermetically-sealed) set of 3 brand new $4 postpaid. New compact Stancor bias or screen supply xfrmrs 55v to 550v @ 600 Ma. to 80 Ma. tapped prt (12 lbs.) $6.50. New compact G.E. 100-watt modulation xfrmrs, multi-impedance (10 lbs), $6.25. new Elmac vacuum condensers 12 $\mu\mu$fd @ 32 kilovolts, $5.50. Please include postage. No c.o.d. S. Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, L. I., N. Y.

SELL KW81, 75A4, model 15 teletype and Alltronics-Howard terminal unit. Equipment like new and guaranteed. Cost over $3400. Sacrifice for $2260. Write or call Ralph Barnett, 755 St. Francois St., Florissant, Mo.

WANTED: Unused electronics tubes, commercial gear, lab test equipment and components. Will pay cash or swap for choice ham gear, etc. Write for Barry's "Green Sheet", chock full of bargains in ham gear, tubes, relay racks, transformers, etc. Barry Electronics Corp., 512 Broadway, New York 12, N. Y.

WANTED: Receivers, Transmitters and accessories. Nehf Enterprises, 118 S. Clinton, Chicago 6, Ill.

TRANSFORMERS (3) W2EWL Special, $3.00 postpaid. S8B, latest diagram, template, 3 xfrmrs. disc ceramic Emics condensers, coils L1 thru L7 for W2EWL Special (Mar. 1956 *QST*), $10.95 postpaid. Vitale, W2EWL, Denville, N. J.

BARGAINS: Send for list of reconditioned receivers and transmitters with new guarantee. 10% down with up to 24 months to pay. In stock, new Collins, Johnson, Hallicrafters, WRL, National, Hammarlund, Gonset, Elmac, Drake, Central Electronics, B&W, Hy-Gain, Mosley and Gotham beams. Shipped on approval. Write Ken, WØZCN, or Glen, WØZKD, for your best deal. Ken-Els Radio Supply Co., 428 Central Ave., Ft. Dodge, Iowa.

DX Radio Coop forwards outgoing QSLS, 2¢ each. Calibook, $5.00, schematics, 50¢. Sam's Information free with schematic, 500 QSO File Cards, $4.00. Free Flyer. "DX Radio Coop", Box 5938, Kansas City 11, Mo.

FOR Sale! January 1954 *QST*, 813 rig 811As, Pi. mod., p/ in cabinet, $150; TCS, xmttr, rcvr, all accessories, 115 AC, 12V DC, spkr, micr., connecting cables, $90; extra TCS dynamotor, 12V, $25. Gary, W1FEU, 109 Mohegan Ave., New London, Conn.

SIX Meters — final amplifier with power supply 500 watts, $200; 1000 watts, $350. Uncle Charlie How Model: W4UCH.

DUMONT 'scope model 241, $70; Gonset 3–30 shortwave converter, $20; Precision E-200 signal generator, $20; RBM-4 Navy receiver 200 Kc-2 Mc., $40, Heath VFO $16. W3IHD, 4905 Roanne Drive, Washington 21, D. C.

PARTNERS, retired hams, electronics investment. R & D Co., W3IVZ.

ANTENNA 80–40–20–15–10, $21.95. Patented. Lattin, W4JRW, Box 44, Owensboro, Ky.

WANTED: Circuit diagrams, tuning units, etc., for Navy GP-6 or GP-7 transmitter. W5JXM, Box 2155, Norman, Okla.

CODE Practice tapes for tape recorders. 7" reel, $3.75; 5" reel, $2.65. Excellent quality, machine recorded. State speed range you desire and recorder speed. Robert I. Holmes, W4BJN, 931 Maple Ave., Dayton, Ky.

NC-109 For sale. Call AT-8-2272. Portland, Oregon.

CALL Plates make fine holiday gifts. Deluxe 8" x 1½" black phenolic laminate with engraved white letters. Only $1.00 PP polished plexiglass base, $1.00 extra. 10" x 3" call plate in black or red for license plate mounting, $2.00. L & J Products Co., P.O. Box 122, Downers Grove, Ill.

DELUXE Kilowatt Collins 310B with bandswitching, $198; 75A3 factory rebuilt with latest modifications 6 and 3 Kc filter calibrator, $398 including speaker. Transmitter has 27 tube speech amplifier 8003s plate modulator individual power supplies for each custom built chassis; Variac; engraved panels 3" illuminated meters P.P. 4–250As final with coils changed through hinged front panel TVI suppressed, spare tubes except 4–250s which are new. In a Bud Deluxe 42" dual rack, $875; new 4–250A final SSB-AM PI network variable vacuum condenser single knob band-switching, $275. Manufactured by Electronics Research Labs. Sell individually. Crate extra. W1PST, Martha's Lane, Chestnut Hill, Mass.

WANT, Want: Collins 51J1 or 51J2. Must be in gud shape. N. K. Thompson, W1LWV, 99 Water, Millinocket, Me.

NEW Mercury outboards and boats. Will take ham gear in trade. Write: Boyd Reter, KØIMO. Boyd's Marine Shop, Clinton, Iowa.

SELL: Model 15 teletype with AC motor and table perfect condition, $175. WØFMK.

WANTED: Aircraft, Airline, Military Electronics gear and test equipment, Collins, Bendix ARC, Airforce, Narco, BC348, ARN6, ARN14, ART13, 51R3, 1884, 51V2. Many others. We pay C.O.D. Advise price, condition. Ritco, Box 156, Annandale, Va. Phone JEfferson 2-5803.

WANTED Urgently: Used "Ranger" and Hallicrafters "S53A". Must be in gud condx. KN8LQK, 7790 Alameda, Youngstown, Ohio.

COLLINS 32V3 for sale. Best offer. Clean, excellent condition. W. E. Waldrup, 220 South Lincoln, Burbank, Calif.

TRADE 1956 black, 4-door customline Ford, overdrive, 20,000 miles, for single sideband equipment. K5ISN, 200 Bafanwood Drive, Hot Springs, Arkansas.

TG-34-A code keyer and amplifier with case, tape 115V to 220V, $18; Hallicrafters SX-28, $95; Heath "Q" multiplier wired, $8; Heath AM-2 reflected power meter wired, $15; Heath voltage calibrator, $5; B&W balun coil, 40M 1000W, $5; 12V dynamotor DM 40-A, $1; BC348 revr, less power supp., $15; revr 652A 2.0–6.0 Mc., $15; Johnson Viking Valiant factory-wired, $390; Johnson GN2 factory-wired, $100; Tecraft 2-M converter, $35; 6-M converter, $35; transmitter 655-A with dynamotor, $20. Most equipment with books. Will ship express collect. K4MQR, Ed Basham, Box 203, Muldraugh, Ky.

SELL: DX-35, VF-1, excellent condition, $65. Stan Weiman, K9HLE, 1511 Brummel, Evanston, Ill. GR 5-7806.

Oops! Left out of my November ad! 500 mill filter choke, $6.00. D. B. Mitchell, R. 1, Box 59, Winnebago, Ill.

HEATH VF-1, power supply, $20, or best offer. K4MQZ, Box 413, Black Mountain, N. C.

ONE DX-100 that will get DX, $175; 2 Navy type two-way transceivers with batteries, ant., phones and keys, in wkg. order, plus 21 Novice band PR xtals, $1.00 each. KØHWK, Guy Hall, Alburnett, Iowa.

WANTED: National AR-16, center-link grid coils for all amateur bands. Willing to pay well for complete set or for individual coils. Also, factory-wired Ranger in excellent condx; in vicinity of Albany. J. E. Whitcraft, 63 South Main Ave., Albany 8, N. Y.

IMMACULATE NC-300, whole station, and tons of parts. Write for list of good deals. Joe Morgan, K9HB8.

SELL Or trade: 75A2 and Viking II with push-to-talk. Includes matching speaker, crystal calibrator, coax relay, coax switch, Viking VFO, low pass filter, Vibroplex Presentation model w/case, Buzi oscillator, monitor, Jones MicroMatch, 2400 hour clock, speech clipper, D-104 mike, 60 ft. Khuene tower, Telrex 10-m. beam, Kreco 10-meter coax, C-D rotor, 200 ft. RG8U. Complete, $550. Also 1 KW phone rig using 70 to 100 watt driver with spares, $300; BC-221-J and A.C. supply, $50; SK-600 socket, $7; Jennings VVC-25, $6; new JFD 50 ft. push-up mast and base, $14; new Elmac 4CX-300, $30; new Elmac 4X-250B, $25; 4W-54, $25; D.C. meters, 0–5 KV, 0–2KV, 0–500 Ma., 0–800 Ma. 0–1 amp, 0–300 Superior 230/115-volt 9 amp powerstat, $25. Will sell all of above or trade toward cabin cruiser. W1GOL, 5 Summit Ter., Peabody, Mass.

FOR Sale: Complete station, less antenna: DX-100, S-85 receiver, Matchbox, Turner mike and key #250. Also have FCC-100 Kc marker, $10. Offers? W9ETM, 412 Woodson St., LaPorte, Ind.

RICH At W8JS is looking for a Bacon banjo, tenor style, any condition, buy or trade ham equipment. Richelieu, 3425 Middleton, Cincinnati 20, Ohio.

COMPLETE Station for sale: Collins A4, $450; Pacemaker, $350 and Thunderbolt amplifier kit, $425. This kit is all assembled but never put on air. Combined sale price, $1225. Cash only. No trades. Call Gloversville, N. Y. 5–4677. K2EJD.

FOR Sale: Heathkit MM-1 VOM, book, leads, DeForests 2 in. 'scope, $25. Dave Thomson, 3213 Osborne, Racine, Wis.

VIKING KW, operating desk, right side, $1295. Curie Radio Supply, 439 Broad St., Chattanooga, Tenn.

SALE: Prop Pitch motor converted transformer, selsyns, dial, excellent, cheap. Storch, 5 Winfield Terrace, Great Neck, L. I., N. Y.

SSB For sale, unmodified, like new condx, KWS1 and 75A4, both for $1728. Also unmodified 32V1 and NC183 with tilt-stand, Select-O-Ject and MB-3 Boomerang for $466; both combinations together, $2150. Cash only, you to pay shipping. Beier, 714 Pluma Drive, Bellevue, Nebraska. Phone Omaha BE-3012. All queries answered.

CLEANING House! Unused JAN tubes: 813, $8; 815, $7; 829, $5; 832, $5; four 807s, $3. Many tubes 1930 vintage, all test OK; write for list. Knight transistor checker, $5; Heath radiation counter, perfect, no batteries, $25; Heath WA-P2 preamp and W-5M Williamson power amp., perfect, both $40. 4 x 5 Speed Graphic, many extras, one owner swap mobile gear or deal. W2DJJ, R. Hertsberg, 241-16 Alameda Ave., Douglaston 62, L. I., N. Y. Tel. BA 5-5384.

SELL HT-30, Heath grid-dipper, Simpson volt ohmmeter, and other effects of late W3JCG. Sl Richie, W3QC, 6402 Osborn Road, Hyattsville, Md.

SELL: Viking I, Viking VFO; 75-watt xtal c.w. xmttr. Best offers. Want 10B or similar SSB. Wolf, 128 Willow St., Brooklyn 1, N. Y.

WANTED: A 125 watt polymatch modulation xfrmr and a 2:1 ratio split secondary interstage xfrmr. Will trade a Collins 75A-3 xtal calibrator for above. Smitty, K4DXI, Box 724, Greensboro, N. C.

XYL Housecleaning: Sonar MB26 xmttr; SR-9 revr, also pwr supp. LeHine 240 (all coils), NC183D revr (Supreme 5" 'scope, #552 HF 10–20 conv. VFX680 FM RCP (extra), sig. gen. #702 Alliance rotator, Cardax E-V mike w/stand, Harrison map of world, indicator for rotator; transmitting tubes and components. Make offer. Mrs. Judith Jacobs, K2KBQ.

WANTED: Factory-wired Central 20A or similar, linear. State condition, accessories and cash price. David Bell, 940 Northill Rd., Baltimore 18, Md.

FOR SALE: 1 Kilowatt xmitter selling in sections. State your needs. Final has push-pull 4-250-A plus 500 watts, Class B, with 810s, companion power supplies, Variac, cabinets, etc. John Savonis, W1DBS, 11 Dwight Court, New Britain, Conn.

COMMUNICATIONS Engineer: Key position with nationally known firm in a modern, well-equipped facility. To assist in development of expanding line of communication and navigation equipment. Experience in design, layout and prototype fabrication essential. Send resume to Mr. J. C. Aidige, Applied Electronics Company, Inc., 213 East Grand Ave., South San Francisco, Calif.

SELL: New tubes, pair 4X250Bs, $20 each; pair 813s, $7 each; pair 4-65As, $8 each; pair 6146s, $3 each. W7AVS, 5318 E. 28th St., Tucson, Arizona.

FANTASTIC — Novices, experienced hams, complete amateur station: SX-24, Q'Xer Globe Scout 65A, Heath VFO, xtals, key, mike; 2–30 Mc. balun and speaker; 2.5 KC at 400 Ma. pwr supply for that KW dream rig of the future. Need money bad. What say? $225 takes all. Bill, K2ZRK, Peapack, New Jersey.

GUARANTEED DX! Wonderful QTH with installed, and Los Angeles approved 80 ft. steel tower, $18,900. Price includes lovely 3 bedroom, den, 2 bathroom home, 200 amp. service, 50 amps in den, large patio, drapes, carpeting, many ham extras. Picture and details upon request. W6AJJ, 15448 State St., Sepulveda, California. Phone: EMpire 2-5117.

SELL: Pair BC-611 walkie-talkies. The chassis, mikerphones, earphones, and batteries are new, 3885Kc., complete: $100. T. Joseph Shank, Jr., 2310 Washington Blvd., Huntington, W. Va., W8KBT.

WANTED: .8(455-J-08) and 2.1 (455-J-21) Collins mechanical filters for 75-A-4. Also vacuum variable 10–300 $\mu\mu$fd. K2HWP, 100 No. Davis St., East Syracuse, N. Y.

COLLINS 75A-1 with "B" sliver, factory-checked, $235; Central 20-A with QT-1 and with Deluxe 458VFO, $215. Cleanest equipment in U. S. A. Will ship. Morgan, KØETG, #19 Briarcliff, St. Louis, Mo.

FOR Sale: Eldico SSB-100 one owner, $300, Gonset G-66 with Universal power supply and connecting cable $150. S. J. Butryn, W6WMY, 7 Paso Cresta, Carmel Valley, Calif.

NOVICES: Good 350 volt 125 Ma. power and filament supply, including 807 tube and socket, 6V6 tube and socket, all for $10; Gardiner code sender with 18 rolls V.G., $19; Vibroplex Lightning Bug, new, $14. W8WTK, John Bittens, 6463 Buckingham Dr., Parma, Ohio.

SELL: Hallicrafters S.P. 44 Panadapter, $35; Sylvan 2 meter converter, 14 to 18 Mc., $15; Tecraft 2 meter converter, 14 to 18 Mc., $18.50; Electro-Voice speech clipper, new, $20; Millen S.W.R. bridge, $5. W2CZE, RD #1, Box 74C, Newton, N. J.

DX-100 for sale. Best offer over $150 takes it. Like new condx. Wiring checked by professional engineer. All letters answered but self-addressed envelope appreciated. W2HBV, 654 Freeman St., Orange, N. J.

SSB Station for sale, HT-32, NC-300, plus all accessories. K2RSP, Frank Smith, 3180 35th St., L. I. C., 6, N. Y. Phone AS 4-7154.

CANADIANS! 75A4, one year old, factory-checked, in new condx, speaker and 6 Kc. filter. Price: $575. VE3BVV, Brantford, RR #4, Ont., Can.

HAM TV Camera. Complete (tubes, power, Ike, etc.). Works FB! Homebrew. Will be willing to ship. Live telecasting, $165. LSJ frequeter w/book, less xtal and cast. Modulated. 20–28 Mc., $35. Mark Goodman, W6AKG, 152 Alta Mesa Rd., Woodside, Calif.

WANTED: Power supply for BC-779-A. Quote price. Ken Goodwin, USCG Air Det., Navy 103, FPO, New York, N. Y.

$200 buys immaculate factory-wired push-to-talk Ranger. Will ship freight collect in original factory carton. K4KWO, Anderson, S. C.

WANTED: Globe Chief 90A and SX-101 Mark III. State price and condx. G. S. Seyffert, 31 South Mercer, New Castle, Penna.

HAM TV Equipment. Bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

FOR Sale: Hallic. 8-76, used but in exc. condx. $95; Mosley 3-element 20-m Vest pocket, $30. Belden Morgan, W1FEA, Kinne Road, Glastonbury, Conn.

SELL: NC-98 with matching speaker, gud condx, $100; AC-1 ant. coupler, $7. Dennis Williams, 1656 Buena Vista, Decatur, Ill.

FOR Sale: Johnson Valiant, factory-wired; in excellent shape: $325. Test it at K2GS. Herbert Herner, M.D., 1033 East 9th St., Brooklyn 30, N. Y. Tel. ESplanade 7-1850.

840 revr in gud playing condx, $50; Vibroplex in like new condx, $9.95. Send for list. Blum, 396 E. Whittier St., Columbus 6, Ohio.

XYL Says, clean out the shack! Have some power supplies with 2-830s, plus chokes, condensers and many other good parts; a couple of 28V dynamotors 375V at 150 mils; Valtran 30-110V output 11 amp. and a bunch of other good items, cheap. Send for list. Milt Berman, W4URG, 1809 Hartman, Louisville, Ky.

SELL: Complete S8B station, NC173 receiver, Model B afcer, BC458 VFO, Central Electronics, 10-B. Gonset 400 watt linear — everything immaculate, worked DXCC, $550. Leon Little, W8NXU, Linden, Ind.

TV Camera wanted. Surplus ATJ type CR-59AAG preferred. W8RMH, 1910 Long Point, Pontiac, Mich.

FOR Sale: DX100, Apache type ant. loading and keying, with spotting P.B. New 6146 tubes, Lynmar T.R. sw., $199. Gene Reynolds, W3EAN, 53 Marple Road, Haverford, Penna.

SELL 75A-3, serial #701. 800 and 3000 cycle filters. Crystal calibrator. Gear reduction tuning knob. Mint condition, never raced. $375 FOB Hartford. W1IKE % ARRL.

MUST Sell for school: Factory-wired Viking Ranger, $210; HQ-140X, $225. Both for $400. Both used less than 100 hours. Please write: W5KKH, 719 Carolyn, Austin, Texas.

FOR Sale: Presently operating complete S8B, AM CW station. Factory-wired Viking II and VFO; B&W 51S8, S8B generator; HQ-140XA and matching speaker, $550 takes all. W2TSR, Burrubach, 80–67 222 St., Queens Village 27, L. I., N. Y.

FOR Sale: Chicago area. Come and get it! All equipment in like new condx: SX101 Mark III, $300; Drake revr, $225; HT-32, $400; JAP SX99, $75; HT-31 linear, $300; 1 Kw linear, March 1958 *QST*, complete with rack and all supplies, $600. 2500V .7A power supply, $75. Bill, Fillmore 5-2215. Westchester, Ill. Frankart, 1259 Boeger Ave.

SELL Collins 32V1, perfect, spare 4D32, $265. Don Peraro, K0CEQ, 3328 So. Glencoe, Denver 22, Colorado.

20A, VFO, QT-1, $215; need 4X150A sockets. W2MHL, 147 Fairview Ave., Paramus, N. J. Tel CO 1-9449.

FOR Sale: Globe King 500A, bought reconditioned from WRL in January, $450; SX-96 in gud shape, $150. D-104 and stand, Johnson low-pass filter free IF xmitter and revr sold together. Will ship. C. Fry, 3621 Melody Lane, Odessa, Texas.

WRL Globe Chief 90 xmtter, in gud condx, will sell for $45 or trade for ???. I am willing to ship. John Burnett, K9JFZ, 224 Northwestern Ave., Lafayette, Ind.

FOR Sale: NC-109, used only a few hours. In practically perfect condx: $125. Bob Jehu, KN1GLL, 15 Lois St., Danbury, Conn.

POLICE cruiser, never used by city, completely equipped with ham gear, 30,000 miles in perfect condx: Elmac AF67, Gonset G66-B 12 volt heavy duty alternator, police-interceptor engine. Will sell whole car or radio gear separately. All inquiries answered. Best bargain since spark-gap days. Call or write to Mike, K2GMV, 119 E. 38th St., N. Y., MU 9-7662.

SELL Or trade Gonset Mobile Twins, complete with mike and Ratred all-band antenna. One year old, in exc. condx. N. K. Thompson, W1LWV, 90 Water St., Millinocket, Me.

SELL ATJ/ATK T.V. camera with power supply and coupler to TV set, 30 feet coax. Companion 35 watt transmitter AXT-2 schema ics and instructions. $225. Babcock 3 channel radio control transmitter BC7C receiver BCR-1A two servos 6 ft. Piper Cub with two-speed engine, $120. Frank Webster, W6CIF, 4721 Willowbrook Ave., L. A. 29, Calif.

FOR Sale: SX-101 Mark III and speaker, plus ohms meter. all less than four months old. No offer refused over $300 on first come first served basis. J. Silver, 155–11 89th St., Howard Beach 14, N. Y.

WANTED: The following coils for National's 1933 SW-3 (DC) receiver: #10, #11, #12, #16, #17, #11A and #12A. Sets of two. Very anxious to buy these! Hasbrouck, 1157 Palms Boulevard, Venice, Calif.

WANTED: for K.W. rig: MultiMatch modulation transformer, plate transformer, one 833A, pair 810s, coax relay, low pass filter. Locals phone gain. K2JDW, 62 Gaston St., West Orange, N. J.

LAKESHORE Industries Bandhopper VFO, $75; homebuilt CW xmittr w/807 final and power supply, $35. R. Houghton, W1NKE, 48 Foster St., Littleton, Mass.

SELL Collins 75A4 receiver. Mint condition, no scratches. 3.1 Kc filter and Collins speaker. Ship anywhere collect, in factory carton. First check for $500. Ed Cerles, WØGFJ, 1035 Westglen Drive, Webster Groves 19, Mo.

SELL 25 to 42 Mc. mobile transmitters, complete with tubes and dynamotor, $7.00 each. Receivers for same frequency, $27.50 each; 1–208 FM signal generator 19 to 45 Mc., $45. Ralph Villers, Box One, Steubenville, Ohio.

75A2 — Late model with 3 Kc and 800CY. Mechanical filter kit installed, good appearance and condition, $295. F.o.b. Atlanta, Ga. W. E. Coogler, Jr., W4DOC, 286 Howard St., S.E.

FOR Sale: $100. Hallicrafters SX28. Needs some work; Hallicrafters S102, new; SCR522 partially converted. Teirex 2M5C, prefer local deal. Contact E. M. Estok, 178 Westminster Place, Lodi, N. J.

SELL: Harvey-Wells TBS-50D, 6VDP8 and 110V AP8 power supplies; Gonset 3–30 converter; Johnson 8WR bridge, with meter; Bud GK-79, G1M1X, Teirex model 10308, 10M beam; Hy-Gain 80AV all-band vertical; Gonset clipper; Hallicrafters S-38 receiver; new 40 ft. telescopic steel mast; Advance antenna relay. Any reasonable offers accepted. W3SIW, 223 Hillock Lane, Pittsburgh 36, Penna.

FOR Sale: Communicator III in gud condx, $200. K. C. Glaser, 2502 Dwenger, Ft. Wayne, Ind.

SALE: Gonset Communicator II, 2-meters, 12 volts, excellent condx, $145. Keller, 514 Stevens Rd., Morrisville, Pa.

SELL: HQ-129X, 100 Kc. calibrator, speaker, $130; Panoramic Radio model PR-1 Panadarter, $115; W3DZZ Tri-band beam, $120. D. A. Contini, W4YUU, 2086 Thomasville Rd., Tallahassee, Fla.

SALE: Collins KW-1. R. Van Wuyckhuyse, W2CR, 412 Humboldt St., Rochester 10, N. Y.

WILL pay $40 for S-20R. Walter Tukkanen, 17th Cml Det. Army Chemical Center, Md.

JOHNSON Adventurer, like new, in perf. condx: $40. Michael Nisenbaum, K2VTY, 1585 E. 172nd St., Bronx 72, N. Y. TI 2-7498.

HAMMARLUND HQ150, in mint condx, matching speaker, $230. Will be glad to deliver 100 mile radius of Chicago. Bill King, 204 Lagoon Drive, Northfield, Ill.

SELL: Best offer over $600: 75A-4, spkr, 3 Kc filter. Ser. No. 4553; Pacemaker, $450, Ser. No. 16888 or best offer; 40 ft. steel tower, $40; 2-el. 20 meter Hy-Lite, $20; D-104, $10; Johnson T-R switch, $18; Johnson SWR coupler and indicator, $28; 6V DC inp. 300V DC at 200 Ma. outp. Vibropack $10; Vibroplex Blue Racer, $8; Original, $10. Must sell fast. J. Bennett, W8QYS, 7107 Orchard Ave., Parma 29, Ohio.

SELL: Johnson KW with desk; new Pacemaker, Ranger, Johnson Audio Amplifier, power reducer for DeLuxe AM-SSB-CW-KW station. A-1 condition. Priced low! 3 five-element Teirex Beams! 10, 15, and 20 meters! Complete track, carriage, winch, and accessories for Deluxe antenna mounting. Full details available! Sell as complete station or individual units. F. W. Cooper, 66 Seminole Way, Short Hills, New Jersey.

FOR Sale: Homebrew xmittr 829-B final, all bands 20–80 meters VFO 120W, C.W. and AM. 1V40 Gotham vertical for $14.00 and shipping. Xmttr, $150 and shipping. Herman La Pierre, K2MMI, West Chasy, N. Y.

SELL: HT-33, $600; Communicator III, 2 meters, $220; SP-44 Panadaptor, $45; BC-221B and A.C. power supply, $65; WRL-speech booster, new, $17; Tri-Ex 38 ft. tower, Roto-Brake and rotator, $150; 2M-15 el. beam, $23; Millen SWR meter, $10; 6V mobile power supply, $25; Tecraft 2M converter, $25; 2M Kreen Ground plane; Mosley 15 and 20 Minibeams, $50; pair of field phones, $30; 2M linear amp. (L&W), 14 Mc. input, $50. Lamb, W3VDE, 1219 Yardley Rd., Morrisville, Pa.

SIX Meter station, used less than 20 hours: HQ-100 revr, Tapetone XC-50 converter with VR power supply, LW-50 transmitter with power supply, Teirex 3-el. beam, Alliance T-12 rotator, Heathkit grid dip meter, EMC Model 104 multimeter, miscellaneous parts, worth $30. College student must sell, all for $350. K2OOG, David Herskowitz, 1590 East 26th St., Brooklyn 29, N. Y.

FOR Sale: Wilcox 96C RF deck only, complete with tubes, $200; FCC terminal unit, $150; OR/5 frequency shift osc., $50. W7KV.

CHANCE Of a lifetime! Factory-converted BC610E and BC614E. Original circuits. Wiring has not been altered. Complete with original manual and calibration data. $450. W. A. Barker, W5LLV, Box 1219, Denton, Texas.

SALE: Six and Two 0 Johnson transmitter, $110, in excellent condx. W3IHF, 31 North Grant, Waynesboro, Pa.

WANTED: 833A. State price and condition. Have shipping container. W2JAO, E. Brinkerhoff, 149 Summit Ter. N., Kinnelon, N. J.

FOR Sale: Complete S8B transmitter. Central Electronics 600-L amplifier; 20A exciter with QT-1 and Deluxe 458 VFO, $540. W9RHE, 6920 N. Medford, Chicago 46, Ill. Tel. RO 3-2360.

10 Mtr. Converterette $8.50; 10 or 15 mtr. Preselector, $4.50. W6RET, 8831 Sovereign, San Diego 11, Calif.

VIKING Courier 200–500 watt amp., used 20 hours, in perfect condx: $229. Will consider mobile equipment as part pay. Also Ranger $195. Charles Kunde, 5770 Gary Ave., Roselle, Ill. Deliver Chicago area free!

RECONDITIONED and guaranteed. Satisfaction guaranteed. Terms financed by us. Hallicrafters S38 $29.00; S85 $89.00; SX99 $119.00; SX96; SX100; SX101; HQ100 $139.00; HQ110 $189.00; HQ140; HQ150; National NC98 $99.00; NC125 129.00; NC300 $279.00; HRO50T; HRO60; NC183D; Globe Scout $69.00; Viking II; Ranger, Valiant; Pacemaker; Thunderbolt; Heath DX35; DX100; Collins 32V; 75A2; 75A3; 75A4; etc. Many other items. Write for free list. Henry Radio, Butler, Mo.

JOHNSON 6N2, excellent, $120. Want: 6V. Gonset noise clipper. W6VMO.

SELL: SX100 receiver. Like new. Best offer over $215. DX20, $30; VF1, $15. K6YBU, Box 121, Calistoga, Calif., 1202 Pine St.

FOR Sale: Valiant, $295; HQ150, $195; HRO5TA1, $95; VHF-152, $35; Matchbox, $30; Micromatch, $20; RME clipper, $20; D-104 w/stand, $12.50; PE-103, $15; new 813s, $5; HV pwr supp., 1800/1800V at 300/300 Ma., $30; PP-911 modulator, 90% completed, $20; BC-696, $5; Q5'er, $5; 2 ea. AVT-112 aircraft trans and 1 ea. 6/12V. pwr supp. $25; Heath Q multiplier, $5; TV rotor, $5 xtal mike w/table stand, $5, w/Atlas baby boom, $6; 3 in. C-B 'scope, $10; Hickok 288X sig. gen. $30; enclosed stand rack cabinet 48 in. $10; 9 in., $3. All F.o.b. plus approx. 1 tone of misc. parts. List for stamped envelope. K0MWQ, 13510 13th Place, Aurora, Colorado.

WANTED: Mobile equipment Elmac A-54, AF-67 transmitter, converter, all-band whip, dynamotor, coax relay, two meter Communicator, Johnson Matchbox, Globe Champion coils, 12 volt battery charger, all-band medium or high pwr. transmitter, beam and rotor (Triband). A. Haberman, W1TDO, 129 Morgan St., Holyoke, Mass.

CANADIANS: Sell Globe Scout 65B, $100, good condition. Nick LeMoine, VE2ALU, 608 Argyle Ave., Westmount Montreal, Quebec, Canada.

I Collect old telegraph keys. What have you? Virginia Zitzow, W1HGM, 11 Oak St., Reading, Mass.

MOBILE Gonset G77 transmitter, G66 receiver, 3-way Universal power supply complete with all cables. Used one month. Price: $395. Murray McKee, 1911 Fifteenth St., Columbus, Ind.

SELL: Two 3X2500F3 Elmac tubes, in used condx. Make an offer. K1ABE, 130 Bishop Ave., Rumford 16, R. I.

COLLINS late model 75A-3 with 3 Kc mechanical filter, crystal filter, used less than 50 hours, perfect condition, $390; DX-100 used little, beautifully wired, $170; Johnson 250 watt Matchbox, $40; Heath antenna impedance meter, $10. Will ship C.o.d. Jim Thompson, WØTRT, 509 7th Ave., S.W., Rochester, Minn.

CHRISTMAS Specials! New Guarantee! Many ready to ship. Prices ONLY on DECEMBER orders: QF-1 $8.95; Scout 680A $89.95; Scout 680 $84.50; DX35 $52.50; SX-71 $155.00; LA1 linear $89.95; SM90 modulator $9.95; NC183D $319.00; NC300 $299.50; King 500 $425.00; TB85O $o7.50; 32V-2 $339.00; 32V-3 $489.00; Champion 300 $349.50; MC-55 converter $38.50; B&W 518B $189.00; Johnson KW with desk $1,150.00; HT-30 S8B $339.00; HT-31 linear $289.00; S8B-100 $395.00; Phasemaster II $245.00; BC610 complete $495.00; KWS-1 $1,325.00; Elmac A54 $95.00; A54H $85.00; Viking 500 (new) $849.00; test and audio equipment, inquire. Trial, Terms. Write Leo, WØGFQ, Box 811, World Radio Laboratories, Council Bluffs, Iowa.

DIAGRAMS for surplus electronics. Stamp for list. Alvaradio, P.O. Box 151, North Hollywood, Calif.

FOR Sale: SX-71 receiver, $125. Aligned and checked and in vy gud condx. 18 amp. Variac, exc. condx, $18. Gary, W1FEU, 109 Mohegan Ave., New London, Conn.

SELL: Latest Viking Ranger, in perfect condx, factory-wired, tested, push-talk, original carton, operating manual, w/Electro-Voice mike, $185. F.o.b. A. Diament, 28 Devonshire Place, Bridgeton, N. J.

JOHNSON Match-box, like-new condx, $35; Viking II and VFO, gud condx, $200. Want HRO. K9HYB, Madison, Ind. Rte #4.

SELL DX-100, in gud condx, first $115 takes it! Ed Hemlow, W2DKO, RFD #1, Fishkill, N. Y.

HEATH DX-100, $185. Lad Jelen, Rt. #4, Medina, Ohio.

FOR Sale: LA-400-B, factory-built, in new condx. Money back guarantee, $125; Mosley Tri-Band beam, 15–20–40 w/TR-4 rotator and mast, $125. George Steed, W5BUX 1605 Redings Drive, Oklahoma City, Okla.

TECRAFT 2-meter converter, 14–18 Mc. output. Factory-wired, red-hot with reasonably good receiver. Now have NC-300 w/converters. $24.95. F.o.b. Jenkintown, Pa. L. Sharpless, W3ULC, 213 York Road.

SELL: HQ-129X 100 Kc xtal osc. frequency standard and matching speaker, $130.00. Larry Bauer, W8GWS, 514 W. Hardin St., Findlay, Ohio.

MERRY Xmas and a Happy New Year from WØCVU. Congratulations to OK1MB winner of the WØCVU Gold Cup for varified 100th country Two Way 88B QSO with WØCVU.

SELL: National NC-300, excellent condition, xtal calibrator, matching speaker, $270.00. W4SGY, Paul Southworth, 739 Lakehurst, Lakeland, Fla.

HAMMARLUND "Pro 130" like new condx, in original crating, $325.00. Also have brand-new AN/FGC-1 teletype terminal unit with standard 2125 and 2975 filters. Weighs 525 pounds crated. $200 f.o.b. Tulsa. Sam Goldish, W5TVG. 3830 South St. Louis Ave., Tulsa, Okla.

SALE: NC-188, $90; Heath Q-multiplier, $7.50. Both together, $95. Wanted: BC-348, Q5'er. Will ship. K3AMU, 205 N. 28th St., Allentown, Pa.

HAM Licenses, resident courses, Novice and General classes. 3 evenings weekly. Delehanty Institute, 117 East 11th St., New York City 3. Tel. GR 3-6900.

DETROIT Hams! W8BPB must curtail operations. Complete deluxe KW phone with push-pull 4-250A final, push-pull 810 modulators, remote controlled. Rack mounted. Antenna tuner, filters, speech compressor, splatter filter and many other features. Power supplies separately mounted, integrated with full complement of relays. This station will be sold at a tremendous sacrifice. It can be seen at 16020 East Warren Ave., Detroit. Phone: TUxedo 4-4014. Hurry! Make an offer! Harold Feighner, W8BPB.

WANTED: 75A2 receiver. State price, condx, etc. W4NI, 2000 Old Vineyard Rd., Winston-Salem, North Carolina.

ELMAC AF-67 transmitter, PMR-7 receiver, and James 6–12–110 volt mobile power supply for sale: $275. All brand new, never used. Marshall Lincoln, KN9KTL, 3858 Forest Grove, Indianapolis 5, Ind.

LEECE-NEVILLE! 100 amp., 12 volt system, complete, in gud condx, $65 or will swap on Comm. 8SB generator. Give best deal first letter. Tower, 65', triangular steel Aprodco, in gud shape, $50 or swap on Comm. 8SB equip. Give best deal first letter. All reasonable replies answered. W5OSV, 6032 Walnut Dr., Ft. Worth, Texas.

POWER Transformer, primart 110. Secondary 1600–2700–3000 at 1000 mils CCS, custom-built by UTC, $45. Want old Hallicrafters long-wave receiver. W3CFD, Boye Hagerty, Honesdale, Penna.

ALUMINUM from Dick's, plus your ingenuity, will make you the best beam for less. Write today for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits. Dick's, W8IJL, Cherry Ave., Route 1, Tiffin, Ohio.

VALIANT, NC-300, both now on air, in perfect condx. Priced for quick sale. $265 each. Reiter, K9DBL, 240 Powell Ave., Clarendon Hills, Ill. Tel. FA 3-0085.

NC-173 receiver for sale. $135.00. Excellent condx. Clean. Like-new appearance. Will ship. C. Brooner, Box 261, Morton, Ill.

OKLAHOMA Kilowatt, P.P. 813s, final, phone D.S.B., 2000 watts P.E.P. B&W KW coils 10, 40, 80, table-top rack, $175 delivered in Oklahoma; 6 foot cabinet, $35. Speech amplifier P.P. 805s, mod. for 813 final, $35. Phone 1006, Edmond, Okla., 316 E. Hurd St., Allen Watson, 316 E. Hurd, Edmond, Okla.

INSTRUCTOGRAPH: Ten tapes, American Morse Code. A.C. oscillator, key, phones. In gud condx. Half price. W. Mahoney, 257 West 20th St., New York 11, N. Y.

SELL: DX-40, $60; Heath VFO $16; HY-Gain 14 AV trapped vertical antenna complete with 14RMK mounting kit, $23. K5OMR, 5934 S. Alameda, Corpus Christi, Texas. All above in perfect condx.

SELL: HQ140X, $150; Johnson Matchbox, $35; D104 mike w/stand, $12. All in excellent condx. Mort Brody, 248 Locust, Indiana, Pennsylvania.

COLLINS 75A3, serial #1655, last model like new, with calibrator, manual. $375. W2EDF, George Orgera, 8 Bayview Ave., Islip, N. Y.

SELL: Meissner 150-B phone/c.w. xmttr with VFO in vy gud condx. Complete with tubes, manual, and major spare parts. Has 1600 volt power supply, 813 final, pair 811 mod., $195. W1AJZ, 38 Ayer Lane, Harwichport, Mass.

VIKING II with VFO, SX-71. Used six months. Excellent condition. First $300 takes all three. Paul Jenkins, 210 Fifth Ave., N. Y. 10, N. Y.

SELL: Viking Ranger A-1 condx, $150; 8X-28A, excellent, with speaker, $100; Millen R-9er 10-meter coil, $8. J. R. Booker, W5ADC, Holdenville, Okla.

WANTED: 40W plate modulator, also any 6v. mobile gear. Write me prices, condx, etc. Glenn Metzler, KN3DHV, Manheim, Penna.

COLLINS KWS-1 and 75A-4, year and a half old. Revr has 3.1 Kc and 800 cycle filters, $1900. Will consider trade on Piper Tri-Pacer or Cessna 172 airplane. W6NQU, 12712 Elmcroft Ave., Norwalk, California.

NEARLY new Mon-Key, in perf. condx, with schematic, $30. Rev. E. L. Battin, 616 Glenwood I, Elgin, Ill. W9OWD

IRE Proceedings, 1949 to 1958; Electronics, 1951 to 1958. Make offer. E. W. Kindall, W7GUW, 4106 41st Ave., S.W. Seattle 16, Wash.

SELL Or trade: H-W TBS50D with AC supply, $85; Morrow 3BR converter, $25; Dynamic mike grip-to-talk stand, $18; BC348 with AC supply, $65; Knight VFO, $28. Will travel 100 miles for 75A1-2, NC-300 or HRO. Middleton, K2UIT, 241 Fairmount, Liverpool, N. Y.

SCR-522 transmitter-receiver with all eighteen tubes. Ideal set for 2 and 6 meters $25.00. Also have SCR-522 parts, send needs. Collins ART-13 transmitter, perfect condition with all tubes $95.00 ART-13 modulation transformer $8.50. ART-13 audio driver transformer $5.50 ART-13 glass S–116 vacuum switch $8.50, clip in type receive vacuum capacitors 50mmf $3.50, 25mmf $5.50, 12mmf $12.00, ARC-5 receivers BC-453 $10.00, BC-454 $8.00, BC-455 $8.00, transmitters BC-457, BC-458, BC-459 $6.50 each. BC-221 frequency meter, with original calibration book $60.00. Wanted: AN/CRT-3 S.O.S. victory girl transmitter, also ARN-30 sets. All guaranteed, C.O.D.'s OK, Bill Siep W4FHY, Box 178, Ellenton, Florida.

FOR Sale: Viking KW amplifier, $1000; 75A3, $350. W. R. West, 830 West 21st St., Norfolk, Va.

FOR Sale: Collins 32V3 and B&W 518B, Collins 75A4 late, TR switch. First $1000. Prefer local deal. W6HXZ, Redondo Beach, Calif.

I Am a member. Are You? W1YLH.

SELL: Used 853-A receiver, like new, recently overhauled. First offer over $60 takes it. C. Caniaares, 210 Grandview, Yonkers, N. Y.

FREQUENCY Meters: LM with orig. book, xtal and CKB 20104 power supply, $42.50. Also BC-221, in good condx, $37.50. K6JFZ, 887 Bridge Rd., San Leandro, Calif.

FOR Sale: Viking Valiant, Hallicrafters S76, matching speaker, D-104 mike with push-to-talk stand, Bud low-pass filter; 60 watt 6 meter transmitter, modulator and power with Valiant, push-to-talk: co-ax relay, 50 Ft. tower, AR-22 rotator, 6 meter beam, all in excellent condition, complete, $525; prop pitch with transformer, $25; Instructograph 10 tapes, $25. O. L. Gilbert, KØBLE, New Prague, Minnesota.

FOR Sale: Los Angeles area only! Presto 7K professional disc recorder, 33⅓, 78. Has good quality playback. Also, miscellaneous items and books. Send for list, Box 106, Downey, California.

SELL: Collins 32V2, excellent condition, with coax relay and spare 4D32, $300. You pay shipping. W5RLU/4, Bill Bettis, 2808 N. John Marshall Dr., Arlington 7, Va.

SELL: Gonset 10–11 meter converter, $15; never used Lysco 10 meter xmitter, $18; PE103 dynamotor, $15; LM7 freq. meter, $25; Johnson Mobile all-band coil, $8; Heath balun coil, $6. W2OJC, 54 Chantle St., Clifton, N. J. PResc-ott, 9-0639.

VIKING KW with table, $1150. Ranger, $195, in exc. condx, both $1250. Will deliver within 250 miles or F.o.b. Wichita, Kansas. J. H. Fugate, 606 Schweiter Bldg., Wichita, Kans.

CRYSTALS Airmailed. Crystals are good Christmas presents. Individually boxed new crystals. Novice, Net, General, FT-243. Custom finished to .01%. Any kilocycle, 3500 to 8700, 99¢. Airmailing 8¢ per crystal. Write for complete frequency listings and brochure. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

WANTED: 500 or 800 cycle and 2.1 Kc mechanical filter for the Collins 75A4 receiver. K2IMD, Shapiro, 1783 Marmion Ave., Bronx 60, N. Y.

TRADE your used cameras, guns, electronic equipment for brand new ham gear. Write for offer. Mount View Distributors, Franklin, Mass.

TELREX 10M-56-79 beam, 3-elements deluxe narrow beam width $45. W7WPO.

RME 4350, perfect, $160; new General Electric 500 watt modulator Class AB1 4-250A's; 6SK7, 6SN7 driver stages, many features, enclosed with tubes, output impedance 5000 to 7800, $180; Globe Scout 680A, like new, factory-wired, $70; new power transformer 60 cycle, 220 volt primary 5000 volt centertapped, 400 milliampere output, $30; 1000 VA constant voltage transformer, 50 cycles 110/220 input 110 output, $50. J. Swift, 1381 Richmond Ct., East Meadow, L. I., N. Y.

GOING S8B. Will sell NC-173, excellent, $100; GPR-90, like new, $300; 50-watt VFO rig, $40. 30 watt plate modulator with power supply, $40; Lynmar TR switch, $8; Heath antenna coupler, $10; W2IEY, 64-19A 186 Lane Apt. 1A, Fresh Meadows, N. Y. NYC, call 01 8-8757.

HRO50T1, w/spkr, and coils, A, B, C, D, Teirad 18A standard, 1000 Kc, 100 Kc, ad 10 kc. Best offer cash or will consider smaller receiver as part trade. Michael J. Marshall, 455 Washington Ave., Dumont, N. J.

SPECIAL SALE: GPR-90, G8B-1, Speaker $425. Hammarlund SP400X $195. HRO-60, calibrator, speaker, Coils A, B, C, D, E, F, AA, AC, AD, $395. Johnson Five Hundred transmitter $525. Courier amplifier $210. 32V-1 $295. KWS-1 $1150. Gonset Communicator 2 meters 6 volts $129. Want: teletype printers, reperforators, perforators, BC-348, BC-221, BC-342 and other surplus in trade for new Johnson Valiant, Thunderbolt, National 303, HQ-170, Towers, Antennas, Rotators, Fisher Hi-Fi, Bell etc. Write Tom, W1AFN, Alltronics-Howard Co. Box 19, Boston, 1, Mass. Richmond 2-0048. Stores: 278 Friend St., Boston (near North Station) 60 Spring St., Newport, R. I.

WILL Trade — Viking II for portable tape recorder. Sell 288X signal generator; 156 Tracecmeter; 209A VTVM; 600A tube tester; all Hickok. 0–8 Heath scope. Paymaster check writer. S-38B. Charles Vangsgard; Box 112, Luck, Wisconsin

PARTS for BC-348 Models, H, K, L, R. Write for list. Panoramic Adapter ID-60/APA maintenance manuals, $2.75; BC-312 and BC-191 maintenance manuals, $2.50. Electronicraft, Box 269, Bronxville 8, N. Y.

GLOBE Chief w/3 novice xtals $45. WRL 755 VFO unused $49. WRL screen mod, unused $9. All in exc. condx, w/instructions. All for $99. Will trade for DX40. Ans. all letters. K4OVF, Jerry Minchey, Westmoreland, Tenn.

SELL: Ranger, $190; 8X-100, $200; Johnson TR Switch, $15; DX-35, $40. All are absolutely perfect. K6VBF, 13837 Sunset Blvd., Pacific Palisades, Calif. GRanite 7-1619.

ELMAC AF-67, PE101C Dynamator for Elmac and Gonset Super-Six — make offer. Tom Moore, 1021 Cecil Place N.W., Washington 7, D. C.

SELL — Heath AG9A Audio Generator — $25.00, also Heath VFO $15.00. Both units are new, wired and tested. W1SUQ, 146 William St., West Haven, Conn.

SELL National NC-125 receiver, Heathkit DX-35 transmitter, VF-1 vfo, and V7-A vacuum tube voltmeter. Make offer. Grant Brooks W3JLL 19 Shady Ave., Greenville, Pa.

COMPLETE mobile station, AF67 Elmac, Gonset 66G, Dynamic mike, all band antenna, all perfect condition. First reasonable offer gets it. W5HUT, 1141 Frenchmen Street, New Orleans, La.

ELMAC A-54, 10-15-20-40-80, PSA-500 A.C. power supply, 12V dynamotor, using it to drive a Meissner 150-B, 250 watt phone or C.W. operates all bands. Screened and by-passed for TVI suppression, crystal mike input. All for $250. W3YVO, C. W. Hoffmeister, 7117 Brompton Rd, Balto. 7, Md.

SELL: Collins 75A2, clean, calibrator, Central Electronics Model B 88B slicer, $350. Wanted; 75A4. W2DTE 29-29 213th Street, Bayside 60, N. Y.

MOBILE: 12v Morrow Twins, complete rig: stainless whip and mount; remote tuner; loading coils; mike; dynamotor; vibrator pack; speaker; filter caps; spare dynamotor; cables, etc. Flawless. Used one season. Will ship. Steal it for $350. Write: Uncle Dick Tiapa, K9DNR, Box 183, Cicero, Illinois.

HEATHKIT DX-40 for sale. Perfect condition. Highest bidder over $65 takes it. Richard Bennett, 981 Pacific St., New Milford, N. J.

VALIANT transmitter for sale. Like new perfect condition. $300.00 FOB Morrisville, Pa. W3ARR 11 West Hedgerow Dr. CY5-5564

HRO coils G, H, and J wanted. W5KYK.

FOR Sale: Collins 75A3 receiver SN-1605. Very good condition $335. John A. Pierce, 203 Chestnut Ave., Westmont 7, N. J.

GONSET 6 meter comm. 11 12 volt 4 xtal sockets, $179; viallant factory wired, $319; NC125, $119; NC183D, $299; HRO50-T, $199; 8X25, $57; VHF152A, $42; all guaranteed like new cond. FOB Chicago 35, Tregar W9IVJ-2023 N. Harlem Ave.

SELL: 20A, QTI, VFO, 250 watt all band amplifier, $300; HQ140X, DB20, speaker $220; hickok 505 scope $125, W5GTR, 1303 Louisiana, McKinney, Texas.

TO settle an estate, complete AM, CW, and SSB station for sale-75A-4 with 3 Kc. filter and speaker, $500.00; B&W 518B-B, $175.00; B&W 5100, $350.00 All in perfect condition. Above plus mike, key, etc., for $825.00. Terms to responsible party. W5GEL, 1021 Vaky St., Corpus Christi.

200 WATT Phone WRL Linear LA-1 $85.000! S-106 Six Meter Receiver $35.00. Tapetone XC-50 Six Meter Converter, 14-18 Mc. I.F. $40.00. Heath VFO-1, wired and Calibrated. Unused $15.00. All like new, with manuals, plus shipping. Wallie Anderson K8JBH, 5743 Parkland, Parma 30, Ohio.

SELL Or Trade: 1 Hallicrafters VFO-HT18, $40; 1 Heath Mod. 0-8 "scope, $30; 1 Millen Rder, 10m coil, $10; 1 UTC S74 transformer, $10; 1 UTC 225 Mc. choke, $5; 1 4-6-5 tube, new, $8; 1 4-125 tube, new, $10; 10 2E26 tubes, $1.50 ea. 1 Mallory 300V 200 Ma pack, $12; 1 Mallory 400V150 Ma pack, $12; 1 Carter Dynamotor 600V 170 Ma., $6. Want: DX-35 or some small transmitter, receiver or what? R. Athearn, P. O. Box 4045, Gary, Ind.

NEED DXCC or WAS confirmations? International Reply-Paid QSL's will help! 25, $1.00. Sample Free. Hart Industries, 467 Parke Birmingham, Michigan.

SAVE time and money with our customised, prepunched chassis and panels. Send specifications. Also aluminum sheets, tubing, rods, angles. Write for price lists. Electronic Chassis Company, Box 1225, Boston 4, Mass.

FOR Sale: New BC-645 — $18.00 — Jim Halverson, K9IBI, 227 Broadway, Eau Claire, Wisconsin.

75A2 and speaker. Good condition. Best offer over $300. Viking I and Viking VFO. TVI suppressed, push to talk, time sequence keying, spare 829B, mike, key, low pass filter, coax relay, $150. Heathkit Q multiplier $7.00. Thomas O. Crow, W6HGW, 901 Robertson Way, Sacramento 18, Calif.

FOR Sale: Perfect DX-100 with heath swr bridge, Johnson 1 Kw lowpass and all necessary connectors; NC-183, 8X-99, both with speakers; Chicago Standard potted components plate xformer, pvi. 115V., sec 1500 V.C.T. @ 400 mils, choke 5.5. hys @ 400 mils. Call or write, all will be answered. Joel Narod, 80 Clarkson Ave., B'klyn 26, N. Y., K2YBI.

HALLICRAFTERS HT32 for sale. Good condition. $550. Walter Porter, W9UJC, 312½ North St., Marshalltown, Iowa.

FOR Sale: Viking I, TVI shielded, with coax antenna and plate power relays, $160; Heath VFO, $20; NC98 Receiver, $120; All in excellent condition. Reason for selling: need money for college. Shipping charges extra. Fred Mertin, W5YHT, 335 N. Gregg, Fayetteville, Arkansas.

HALLICRAFTERS — HT-33 Kilowatt Linear. Full output with any 15 watt exciter. Ten hours operation. Original carton. Warranty card. Payment of bad debt. Am SWL and cannot use. New $775.00. Want $550.00. Freight collect. No haggling. Phil Lectro, 187 Culver Road, Rochester, N. Y.

SELL: Heath DX40, $63; VF-1, $18; Hallicrafters S-85, all in perfect condx. Robert Leinwand, 108-20 62 Dr. Forest Hills 75, L. I., N. Y. K2EMD.

FOR Sale 3 ea New 4-400A tubes @ $20.00 ea. Gonset G-66B Receiver factory converted to E Model complete with universal power pack $190.00. Lesly W. Williams, P. O. Box 794, Nutting Lake, Mass.

KILOWATT Amplifier with power supply using push-pull 810's and fully inclosed R.F. section plus an 813 driver unit, $35 worth of transmitting tubes, and antenna tuner, $165. Dave Ranney, Box 590, Yankton, South Dakota.

SELL: College forces sale of my DX-100 with push-to-talk, co-ax relay, etc., HQ-140-X with Heath Q-multiplier, both used only one year, in excellent condx. Also: Heath Grid Dipper, Vibroplex bug, Q8T's 1949, 54-57 complete. Best offer takes one or all. Ross Harris, W1ARU, Kirkland B-24, Cambridge 38, Mass.

WANTED: Coils for 160 meters for Hallicrafter HT-9 Transmitter; W9PKA Arthur F. Maknke, 23 156th Place, Calumet City, Illinois.

FOR Sale: HT-32; $535. Used very little, in excellent condition. Need money for school. George Reaser, W8KYH, 1083 Selwyn Road, Cleveland Heights 12, Ohio.

SELL: NC 183D Receiver, like new, with speaker and slicer $260. Johnson Viking I in Viking II cabinet. New condition with VFO — $150. W2HFM, 60 Lindgren, Merrick, N. Y.

ANY kit wired and tested. Send for price list. A. Breiner W3ZRQ, 212 Race Street, Tamaqua, Penn.

SELL: Complete station. NC-173, $115; SW-54, $30; DX-35, $45; Harvey Wells TBS-50C & P.S., $75; Heath VF-1, $15; Knight 100-kc. calibrator, $7; Gonset 2M converter, $30. All perfect and with instructions. Bob Hanway, 823 Vermont Avenue, Fairmont, West Va. K8GNZ.

SELL: 813 Power Amplifier with antenna tuner and 3 foot relay rack — $65. New Heathkit Q Multiplier, assembled — $12. VFO with built-in power supply — $16. Dennis McNeal, 8411 Walnut, Munster, Indiana.

SELL: Neat homebrew 60W 80-40M CW XMTR. W/3xtals, mtr etc. Compl. $25.00. R. Sylvan W9CBT, 4816 N. Avers, Chicago, Ill. CO-7-9356.

SELL or trade: 4 — 250A final amplifier for 6, 10, 15 meters; Bias, screen, and plate supplies for 1.5 kilowatts. 6 meter exciter, 15 watts, 2E26, 12AT7; all in one rack, sold together for $250.00 or stero equipment. D.C. Flowers, K4GAI, 811 Drewry St., Atlanta 6, Ga.

CHAMPION Vivroplex like new $9.95, Bud codemaster 9.95, 840A. New tube checker, send for list. Blum, 398 E. Whittier St., Columbus 6, Ohio.

SAVE $40 on new HQ-160, $340 plus shipping. Thomas Gavan, 225 West Broadway, Apt. C-2, Long Beach, L. I., N. Y. GEneral 1-4008.

SELL: Super Pro, rack mounting, converted, no surplus, $125; WRL 755 VFO, $40; TV boosters for 6 & 2 meters, $15; S39 Portable, $40. Want KE93. Chester Benson, W9IFB, 333 So. 5th, Richmond, Indiana.

WANTED: Collins 75A-2 in A-1 condition. No modifications. State serial number. W8KEO, Bellaire, Mich.

2-METER Gonset Communicator II 6 volt. Excellent condition. Good buy at $145.00 cash. William Batte, 146 Westbrook Dr., Hampton, Va.

VIKING II, VFO, no modifications, daily use, guaranteed excellent, original carton, $197 or 10% under the lowest price advertised in last month's HAM-ADS, whichever is lower, Went 88B. W4VDY, Box 1023, Tavares, Florida.

MERRY Christmas and best wishes for DX for another wonderful year to all my friends both old and new. Uncle Charlie How.

SELL: Viking I, $125; 8X-28 with spkr $85; Underwood 5 typewriter, $25. All excellent condx. Gill DeBard, K7BJB, 840 Reeves, Reno, Nevada.

FOR The Best deal in new and used Ham Gear, try Bob Graham, W1KTJ, 505 Main Street, Reading, Mass. Reading 2-4000 (Graham Co.)

FOR Sale: Johnson Viking 500, factory-wired Ser. No. 42342, like new, $695; Collins 75A4 latest model Ser. No. 4786 with matching speaker, light and clock, 300 Kc filter, $585; Johnson Adventurer, two Novice xtals, $40; BC-458 converted for 80 meters, 5X shaped keying — 115V power supply, $35; BC845, unused, all tubes, $12.50. Need the money. W4FVS, 2145 Brookview Dr., N.W., Atlanta 18, Ga.

FOR Sale: DX100 xmttr, wired in 1958, $189.50; Lysco 600, VFO, TVI-suppressed c.w. xmttr with model 50 tuner, $55; 8X-96 revr and spkr, $150; Hy-Gain model 18AV Multiband vertical antenna, $40. Prices basis Casper, Wyoming, P.O. Box 2471, Joe Prochaska, W7BHH.

FOR Sale: Collins 32V3 with low pass filter and antenna relay, $425. Collins 75A4 and speaker with built-in extras in speaker cabinet, $525. Both in perfect condition. E. C. Manning, Jr. W5GFO, phone MArket 4-8453, 2302 N. Main, Ft. Worth, Texas.

NEED CASH for college: Will sacrifice parts for KW amplifier (Page 187, 1955 Handbook). Everything mounted, you just solder. Less tube and power supply, $50 postpaid. Heathkit direct reading capacity meter. Clean. $30. Bill Ellis, K6UES, ex-K2MKW, 150 Kingsley Ave., Palo Alto, Calif.

WANT KW8-1; sel 1600-L, $330; 20A with 458VFO, 10 meter converter, and QT-1, $180; 250W Matchbox, $30; DB23, $20; all new condition except DB23. W6WZD, P.O. Box 761, Menlo Park, Calif.

FOR Sale: WRL 300 xmtr Globe Champion, $300; RME 4300, $100; K6BYE, 6533 W. 86th Pl., Los Angeles 45, Calif. Phone ORchard 2-8873.

SALE Or Trade: One 304TL, two 813 tubes, R.C.A. Signal Generator Model WR-67A. Want Grid Dip Meter, DB-23, Mon-Key, VHF 152-A, etc. W1RDC, 917 Homestead Ave., Holyoke, Mass.

I ARRL? K2VDJ.

SELL: 32V3 factory-converted from V1. $350. Virgil Schaffer, 3165 Grove Court, Cedar Rapids, Iowa.

SELL: 8X-100 receiver, excellent condition. $200 plus postage. John Morgan, K9BLX, P.O. Box 610, Cary Hall, Lafayette, Ind. Telephone 92-81241.

S38D receiver (Hallicrafters) for sale, $30 plus postage. Walter Steen, Woodstock, Conn.

VALIANT, month old, $365; 8X-99, $115; Adventurer, $35; Heath SWR meter, new, $18; Matchbox, $35. Going to college, need the money. K4RTA, 3927 Ivy Dr., Nashville, Tenn.

FOR Sale: 8X-62 with speaker, in perfect condition, $160. Will be willing to ship. Paul E. Dudley, W5DYS, Trumann, Arkansas.

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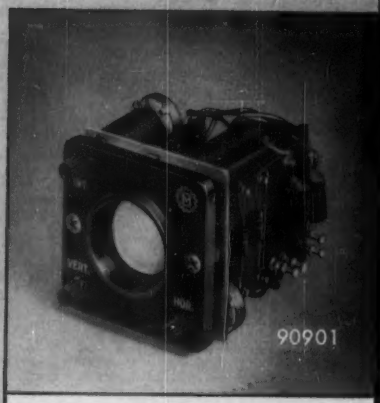

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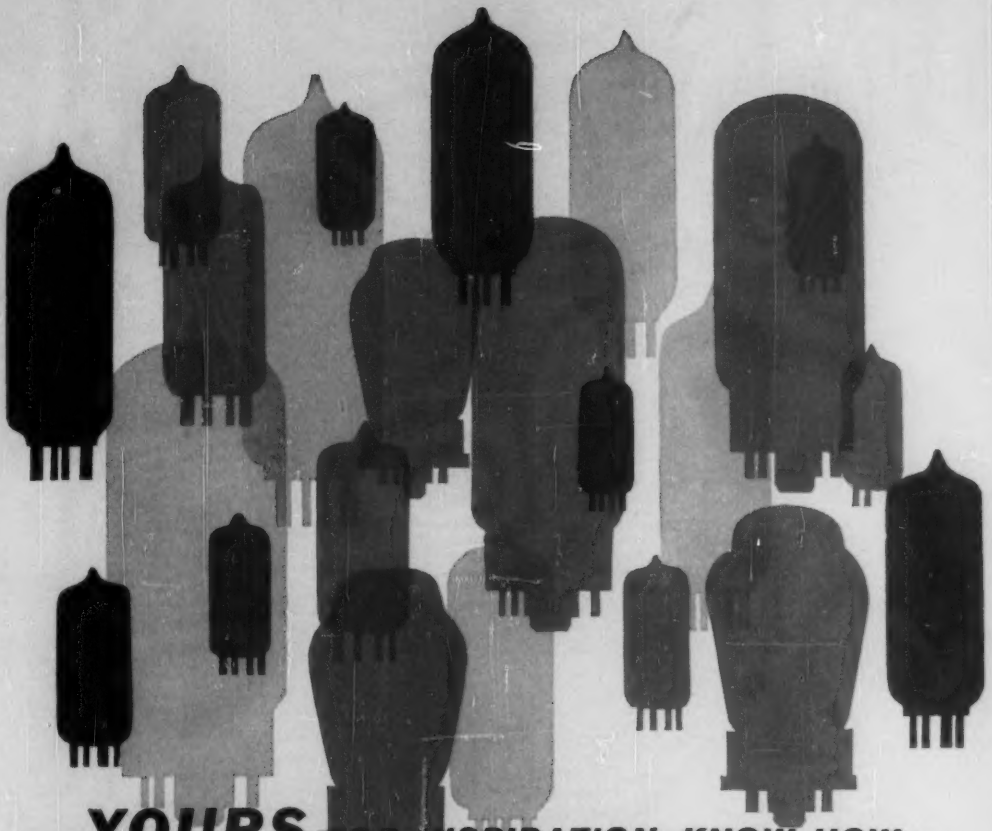
Index to Advertisers

Ack Radio Supply Company 201
Adirondack Radio Supply 207
Allied Radio Corp. 184, 202, 234
Alltronics-Howard Company 216
Amateur Electronic Supply 213
American Electronics Company 188
American Radio Relay League
QST 144, 148
Learner Manual 215
Hints & Kinks 219
Problem 200
Binders 198
Library 221
Amplex Radio Products, Inc. 206
Arabian American Oil Company 210
Arrow Electronics, Inc. 168, 173, 192
Ashe Radio Company, Walter 170, 224
Babb Electronics, J. Wilbur 184
Barker & Williamson, Inc. 137
Berton's, Inc. 194
Box 185 204
Brooklyn YMCA Trade School 232
Burghardt Radio Supply 190
Burstein-Applebee Company 222
C & G Radio Supply 200
Candler System Company 210
Central Electronics, Inc. 211
Cleirality 224
Collins Radio Company 2
Columbia Products Company 182
Commercial Radio Institute 221
Communication Company 189
Communication Products Company, Inc. 121–124
Consolidated Radio Company 220
Cornell-Dubilier Electric Corp. 185
Cosmos Industries 153
Crawford Radio, The 210
Cubex Company 198
Cushman Products 149, 202, 208, 214
Dampp-Chaser, Inc. 205
DeMambro Radio Supply Company, Inc. 184, 162
Dow Radio, Inc. 156
Dow-Key Company, Inc., The 207
DXerama 206
Eitel-McCullough, Inc. 4
Eldico Electronics 149
Electronic Supply 181
Electro-Voice, Inc. (RME) 145
Elmar Electronic Supply Corp. 180
Evans Radio 205
E-Z Way Towers, Inc. 135
Federated Purchaser 218
Fort Orange Radio Distributing Company, Inc. 185, 215
Gardiner & Company 212
Gates Radio Company 225
General Crystal Company, Inc. 223
General Electric Company 112
General Electric Service 222
Genesee Radio & Parts Company 188
Gonset Div. 128, 129
Gotham 126, 127
Graham Electronics Supply 200
Greenlee Tool Company 211
Gries Electronics, Inc. 223
Groth Mfg. Company, R. W. 212
Hallicrafters Company, The 1, 111
Ham Buerger 200
Hammarlund Mfg. Company, Inc. 123
Harrington Electronics 218
Harrison Radio 179
Harvey Radio Company, Inc. 169
Harvey-Wells Electronics, Inc. 213
Heath Company, The 116–120
Henry Radio Stores 138, 139, 207, 223
Hi-Par Products Company 206
Illumitronic Engineering 163
Institute of Radio Engineers 233
Instructograph Company, Inc. 223
International Crystal Mfg. Company, Inc. 141, 151
International Instruments, Inc. 222
Johnson Company, E. F. 113, 114, 115
Johnson Electronics, Inc. 171
Kaimuki Radio Company, Ltd. 174
Ladd Electronics Company 221
Lafayette Radio 180
Lakeshore Industries 173
Lampkin Labs., Inc. 235
Lavender Radio Supply Company 230
Lettine Radio Mfg. Company 188
Lindsay Antenna & Specialty Products, Ltd. 212
L W Electronic Laboratory 186
Mallory & Company, Inc., P. R. 145
Mark Mobile, Inc. 194
Master Mechanic Mfg. Company 206
Master Mobile Mounts, Inc. 167
Millen Mfg. Company, Inc., James 232
Morrow Radio Mfg. Company 157
Mosley Electronics, Inc. 130, 131
National Company, Inc. ..... Cov. III
National Tuberculosis Assn. 222
Neil Company, The 217
Newark Electric Company 193
North Hills Electric Company, Inc. 215
Organs & Electronics 202
P & H Electronics, Inc. 146, 188
Petersen Radio Company, Inc. 8
Philco TechRep Div. 193
Port Arthur College 204
Portland Radio Supply Co. 190, 208
Radio Amateur Call Book, Inc. 204
Radio Electric Service Company of Penna. 210
Radio Parts Company 217
Radio Product Sales, Inc. 167, 200
Radio Publications, Inc. 140
Radio Shack Corp. 177, 187
Raytheon Mfg. Company 165
RCA Electron Tube Div. ..... Cov. IV
Regency Div. of I.D.E.A., Inc. 152
Rider Publisher, Inc., John F. 191, 196
Salem Electronics 175
Santa Rosa Electronics Company 210
Scientific Industries, Inc. 225
Scientific Radio Products, Inc. 203
Shell Electronic Mfg. Corp. 180
Sunair Electronics, Inc. 161
Swarts Jewelry Company 213
Tapedcode 219
Tapetone, Inc. 132, 133
Technical Material Corp. 7
Teesall 203
Tele-Vue Towers, Inc. 217
Telrex, Inc. 147, 231
Temaslab 179
Terminal Radio Corp. 186
Triad Transformer Corp. 168
United Transformer Corp. ..... Cov. II
Valley Electronic Supply Co. 211
Valley Radio Distributors 210
Van Sickle Radio Supply Company 216
Vesto Company, Inc. 234
Vibroplex Company, Inc., The 215
Waco Communications Company 213
Waters Mfg., Inc. 178
Western Radio & TV Supply Company 214
Wilson, Inc. Willard S. 205
World Radio Labs. 180, 213, 214, 226



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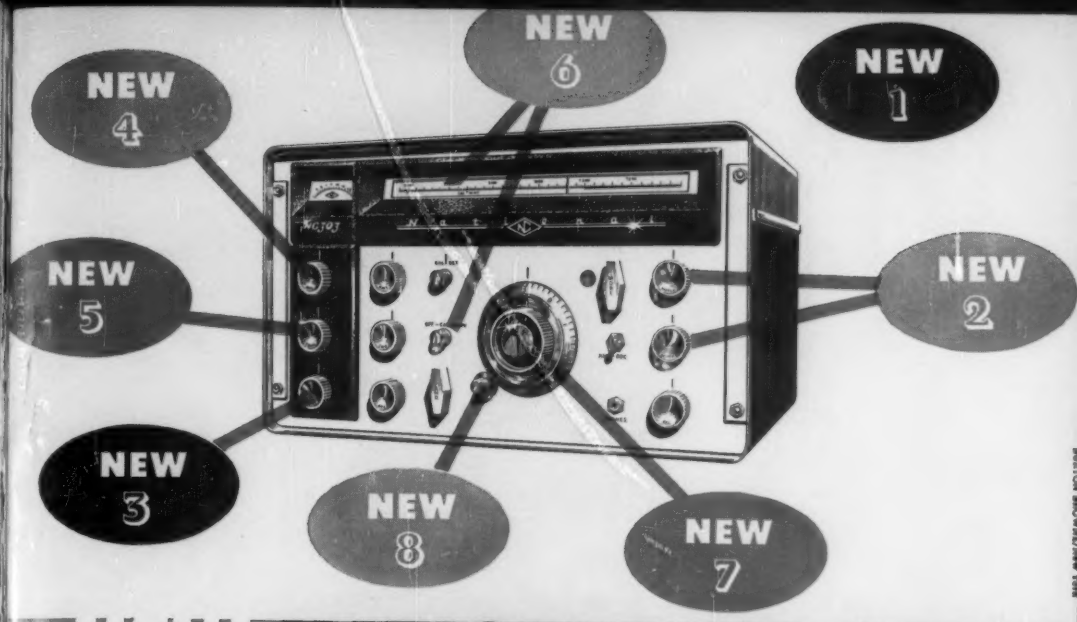

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WV2ASE	KN2OUH	W3PSK
K2AUM	W2OUY	W3RDS
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K2BGO	W2PMP	W3TFN
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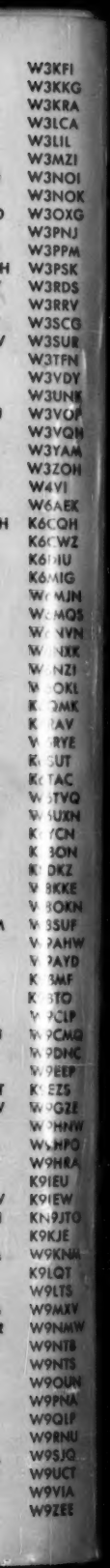
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